

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,3 H
Edition : 28.05.90
Replaces : 10.11.89
Test oil : ISO-4113
Combination no. : 0 400 074 899
Injection pump
Pump designation : PES4M55C32ORS167
EP type number : 0 410 054 960
Governor
Governor design. : RSF375/1700M69-4
Governor no. : 0 420 021 139

Customer-spec. information
Customer : MB-NFZ

Engine : OM601-2.3L

1st version kW : 49.0

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)
Rack travel in mm : 20.00...22.00
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270
Tolerance + - ° : 0.00 (1.00)
Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000
Rack travel in mm : 12.30...12.40
Del.quantity cm3/ : 3.6...3.7
100 s: (3.5...3.8)
Spread cm3 : 0.2
100 s: (0.3)

2nd speed rpm : 375.0
Rack travel in mm : 5.5...5.7
Del.quantity cm3/ : 0.5...0.6
100 s: (0.4...0.9)
Spread cm3 : 0.1
100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1000
Aneroid pressure h: 1100
Del.quantity : 36.0...37.0
1000 : (35.0...38.0)
Spread cm3 : 2.50
1000 : (3.00)

RATED SPEED

1st version
Control lever
position degrees: 50...0
3rd rack travel in: 9,0...9,5
Speed rpm : 1800
4th rack travel in: 2300
Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000
Rack travel in mm : 1,4...1,5

LOW IDLE 1
Control lever
position degrees: 12...16
Setting point w/out bumper spring

Speed rpm : 375  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 250  
Minimum rack travel: 10.20  
Speed rpm : 375  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 3.00  
Speed rpm : 580...680  
Speed rpm : 1000  
Maximum rack travel: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 420  
Rack travel in mm : 4,4...4,6  
: (4,3...4,7)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 1400  
Rack travel in m: 11.70...12.00  
3rd speed rpm : 1650  
Rack travel in m: 11.40...11.70  
4th speed rpm : 500 \*  
Rack travel in m: 11.60...11.90 \*  
5th speed rpm : 800\*\*  
Rack travel in m: 12.00...12.30\*\*

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm<sup>3</sup>/ : 36.0...37.5  
1000 s: (35.0...38.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.)  
Aneroid pressure h: 1100

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Speed rpm : 1650  
Del.quantity cm<sup>3</sup>/ : 36.5...38.5  
1000 s: (35.5...39.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 31.5...33.0  
1000 s: (30.5...34.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000 s: (33.0...36.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1800  
Rack travel in mm : 9.00...9.50  
Del.quantity cm<sup>3</sup>/ : 28.0...32.0  
1000 s: (27.0...33.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (3.00)

#### LOW IDLE

Speed rpm : 375  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
1000 s: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed rpm : 425  
Rack travel in mm : (7,0...8,6)  
Del.quantity cm<sup>3</sup>/ : -  
1000 s: (10,5...18,5)

Remarks:

Pin projection = 16.60...16.70 mm

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

- \* Setting point for negative torque  
control - negative retainer behind
- \*\* Reference measurement:  
Control-rod travel and delivery too  
large - position spiral spring  
Control-rod travel and delivery too  
small - position spiral spring upwards

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,3 a  
 Edition : 28.05.90  
 Replaces : 10.11.89  
 Test oil : ISO-4113  
  
 Combination no. : 0 400 074 900  
  
 Injection pump  
 Pump designation : PES4M55C320RS167  
 EP type number : 0 410 054 960  
 Governor  
 Governor design. : RSF360/1900M70-4  
 Governor no. : 0 420 021 123

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM601-2.3L

1st version kW : 58.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 20.00...22.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.80...12.90

Del. quantity cm<sup>3</sup>/ : 4.0...4.1

100 s: (3.9...4.2)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 335.0

Rack travel in mm : 5.1...5.3

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del. quantity : 40.0...41.0

1000 : (39.0...42.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,0...7,5

Speed rpm : 2100

4th rack travel in: 2500

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

### POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 11...15

Setting point w/out bumper spring

Speed rpm : 335  
Rack travel in mm : 5.2

#### Testing:

Speed rpm : 250  
Minimum rack travel: 7.50  
Speed rpm : 335  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.50  
Speed rpm : 550...650  
Speed rpm : 1000  
Maximum rack travel: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 3,9...4,1  
                  : (3,8...4,2)

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in mm : 12.80...12.90  
2nd speed rpm : 1400  
Rack travel in mm : 12.20...12.50  
3rd speed rpm : 1900  
Rack travel in mm : 11.40...11.70  
4th speed rpm : 500  
Rack travel in mm : 12.00...12.30 \*  
5th speed rpm : 800  
Rack travel in mm : 12.40...12.70\*\*

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

#### Measurement

Speed 1/min : 1000

1st pressure hPa : 900  
Rack travel in mm : 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in mm : 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm3/ : 39.5...41.0  
                  1000 s: (38.5...42.0)  
Spread cm3 : 2.50  
                  1000 s: (3.0)  
Aneroid pressure h: 1100

Speed rpm : 1900  
Del.quantity cm3/ : 39.5...41.5  
                  1000 s: (38.5...42.5)  
Spread cm3 : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 500  
Del.quantity cm3/ : 34.5...36.0 \*  
                  1000 s: (33.5...37.0) \*  
Spread cm3 : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 800  
Del.quantity cm3/ : 37.5...39.0 \*\*  
                  1000 s: (36.5...40.0)\*\*  
Spread cm3 : 2.50  
                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 2100  
Rack travel in mm : 7.00...7.50  
Del.quantity cm3/ : 22.0...26.0  
                  1000 s: (21.0...27.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 335  
Rack travel in mm : 5.10...5.30  
Del.quantity cm3/ : 5.0...6.0  
                  1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
                  1000 s: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed rpm : 360  
Rack travel in mm : (12,3...13,7)  
Del.quantity cm3/ : -  
                  1000 s: (33,0...41,0)  
Current A : 1,8  
Control lever at full-load stop  
Speed rpm : 2500  
Rack travel in mm : 0,0...1,0

Current  
short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0 / 1,8A

Remarks:

Pin projection = 16.60...16.70 mm

TESTING PNEUMATIC SHUTOFF DEVICE  
-Control lever at idle stop.  
With  $n = 335$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

\* Setting point for negative torque  
control - negative retainer behind  
\*\* Reference measurement:  
Control-rod travel and delivery too  
large - position spiral spring  
Control-rod travel and delivery too  
small - position spiral spring upwards

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,0 r5
Edition : 28.05.90
Replaces : 17.02.89
Test oil : ISO-4113
Combination no. : 0 400 074 904
Injection pump
Pump designation : PES4M55C320RS169
EP type number : 0 410 054 959
Governor
Governor design. : RSF375/2300M56-6
Governor no. : 0 420 021 110

Customer-spec. information
Customer : MB-PKW

Engine : OM601-ECE

1st version kW : 53.0

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
: (1.95...2.15)
Rack travel in mm : 20.00...22.00
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 3.2...3.3

100 s: (3.1...3.4)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 375.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 32.0...33.0

1000 : (31.0...34.0)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,0...9,4

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 375  
Rack travel in mm : 7.0

Testing:

Speed rpm : 250  
Minimum rack travel: 11.50  
Speed rpm : 375  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.50  
Speed rpm : 640...740  
Speed rpm : 1000  
Maximum rack travel: 1.80

SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 5,8...6,0  
                  : (5,7...6,1)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in mm : 12.80...12.90  
2nd speed rpm : 1800  
Rack travel in mm : 12.20...12.40  
3rd speed rpm : 2200  
Rack travel in mm : 11.90...12.10

Aneroid/Altitude  
Compensator Test

1st version

Pressure hPa : 950  
Rack travel mm : 0.00...0.20

1st pressure hPa : 900  
Rack travel in mm : 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in mm : 1.80...2.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100  
Speed rpm : 1800  
Del.quantity cm3/ : 34.0...35.5  
                  1000 s: (33.0...36.5)  
Spread cm3 : 2.50  
                  1000 s: (3.0)  
Aneroid pressure h: 1100  
Speed rpm : 2200  
Del.quantity cm3/ : 34.0...36.0  
                  1000 s: (33.0...37.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Aneroid pressure h: 1100  
Speed rpm : 2500  
Rack travel in mm : 9.00...9.40  
Del.quantity cm3/ : 22.0...26.0  
                  1000 s: (21.0...27.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

LOW IDLE

Speed rpm : 375  
Rack travel in mm : 6.90...7.10  
Del.quantity cm3/ : 5.0...6.0  
                  1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
                  1000 s: (1.50)

SETTING PNEUMATIC FAST IDLE  
(ELA)

Speed rpm : 425  
Rack travel in mm : (8,6...10,2)  
Del.quantity cm3/ : -  
                  1000 s: (12,0...20,0)  
Vacuum hPa : 400

Remarks:

Pin projection = 16.60...16.70 mm

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 19.3°...19.7°  
(19.2...19.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be



greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With  $n = 375$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,3 B  
 Edition : 10.11.89  
 Replaces : 28.05.90  
 Test oil : ISO-4113

Combination no. : 0 400 074 905

Injection pump  
 Pump designation : PES4M55C32ORS167  
 EP type number : 0 410 054 960  
 Governor  
 Governor design. : RSF375/1900M69-1  
 Governor no. : 0 420 021 102

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM601-2.3L

1st version kW : 58.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 20.00...22.00  
 Firing order : 1- 3- 4- 2

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Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 4.0...4.1

100 s: (3.9...4.2)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 375.0

Rack travel in mm : 5.0...5.2

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 40.0...41.0

1000 : (39.0...42.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,0...7,5

Speed rpm : 2100

4th rack travel in: 2500

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 11...15

Setting point w/out bumper spring

Speed rpm : 375  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 250  
Minimum rack trave: 10.20  
Speed rpm : 375  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 3.00  
Speed rpm : 450...550  
Speed rpm : 1000  
Maximum rack trave: 1.50

#### SET IDLE AUXILIARY SPRING

Speed rpm : 420  
Rack travel in mm : 3,9...4,1  
                  : (3,8...4,2)

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 1400  
Rack travel in m: 12.20...12.50  
3rd speed rpm : 1900  
Rack travel in m: 11.40...11.70  
4th speed rpm : 500 \*  
Rack travel in m: 12.00...12.30 \*  
5th speed rpm : 800\*\*  
Rack travel in m: 12.40...12.70\*\*

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

#### Measurement

Speed 1/min : 1000  
1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm3/ : 39.5...41.0  
                  1000 s: (38.5...42.0)  
Spread cm3 : 2.50  
                  1000 s: (3.0)  
Aneroid pressure h: 1100

Speed rpm : 1900  
Del.quantity cm3/ : 39.5...41.5  
                  1000 s: (38.5...42.5)  
Spread cm3 : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 500 \*  
Del.quantity cm3/ : 34.5...36.0 \*  
                  1000 s: (33.5...37.0) \*  
Spread cm3 : 2.50  
                  1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 800\*\*  
Del.quantity cm3/ : 37.5...39.0 \*\*  
                  1000 s: (36.5...40.0)\*\*  
Spread cm3 : 2.50  
                  1000 s: (3.00)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 52.0...0.0  
                  1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

#### HIGH IDLE

1st version  
Aneroid pressure h: 1100  
Speed rpm : 2100  
Rack travel in mm : 7.00...7.50  
Del.quantity cm3/ : 22.0...26.0  
                  1000 s: (21.0...27.0)  
Spread cm3 : 2.50  
                  1000 s: (3.00)

#### LOW IDLE

Speed rpm : 375  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 5.0...6.0  
                  1000 s: (4.5...9.0)  
Spread cm3 : 1.00  
                  1000 s: (1.50)

#### SETTING PNUEUMATIC FAST IDLE (ELA)

Speed rpm : 425  
Rack travel in mm : (6,6...8,2)  
Del.quantity cm3/ : -  
                  1000 s: (11,5...19,5)  
Vacuum hPa : 400

Remarks:

Pin projection = 16.60...16.70 mm

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

TESTING PNEUMATIC SHUTOFF DEVICE  
-Control lever at idle stop.  
With  $n = 375$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

\* Setting point for negative torque  
control - negative retainer behind  
\*\* Reference measurement:  
Control-rod travel and delivery too  
large - position spiral spring  
Control-rod travel and delivery too  
small - position spiral spring upwards

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,3 C  
Edition : 28.05.90  
Replaces : 10.11.89  
Test oil : ISO-4113  
  
Combination no. : 0 400 074 907  
  
Injection pump  
Pump designation : PES4M55C320RS167  
EP type number : 0 410 054 960  
Governor  
Governor design. : RSF360/2000M70  
Governor no. : 0 420 021 105

Customer-spec. information  
Customer : MB-NFZ

Engine : OM601-2.3L

1st version kW : 60.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.80...12.90

Del. quantity cm<sup>3</sup>/ : 4.0...4.1

100 s: (3.9...4.2)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 335.0

Rack travel in mm : 5.1...5.3

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del. quantity : 40.0...41.0

1000 : (39.0...42.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,0...7,5

Speed rpm : 2200

4th rack travel in: 2500

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 11...15

Setting point w/out bumper spring

Speed rpm : 335  
Rack travel in mm : 5.2

Testing:

Speed rpm : 250  
Minimum rack travel: 7.50  
Speed rpm : 335  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.50  
Speed rpm : 550...650  
Speed rpm : 1000  
Maximum rack travel: 1.50

SET IDLE AUXILIARY SPRING

Speed rpm : 400  
Rack travel in mm : 3,9...4,1  
                                  : (3,8...4,2)

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 1400  
Rack travel in m: 12.20...12.50  
3rd speed rpm : 2000  
Rack travel in m: 11.40...11.70  
4th speed rpm : 500 \*  
Rack travel in m: 12.00...12.30 \*  
5th speed rpm : 800\*\*  
Rack travel in m: 12.40...12.70\*\*

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 950  
Rack travel mm : 0.00...0.20

Measurement

Speed 1/min : 1000  
1st pressure hPa : 900  
Rack travel in m: 0.50...0.70  
2nd pressure hPa : 750  
Rack travel in m: 1.80...2.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100  
Speed rpm : 1400  
Del.quantity cm<sup>3</sup>/ : 39.5...41.0  
                          1000 s: (38.5...42.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.0)  
Aneroid pressure h: 1100

Speed rpm : 2000  
Del.quantity cm<sup>3</sup>/ : 39.5...41.5  
                          1000 s: (38.5...42.5)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 500 \*  
Del.quantity cm<sup>3</sup>/ : 34.5...36.0 \*  
                          1000 s: (33.5...37.0) \*  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)  
Aneroid pressure h: 1100  
Speed rpm : 800\*\*  
Del.quantity cm<sup>3</sup>/ : 37.5...39.0 \*\*  
                          1000 s: (36.5...40.0)\*\*  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
                          1000 s: (52.0...0.0)  
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Aneroid pressure h: 1100  
Speed rpm : 2200  
Rack travel in mm : 7.00...7.50  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
                          1000 s: (21.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
                          1000 s: (3.00)

LOW IDLE

Speed rpm : 335  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
                          1000 s: (4.5...9.0)  
Spread cm<sup>3</sup> : 1.00  
                          1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed rpm : 360  
Rack travel in mm : (12,3...13,7)  
Del.quantity cm<sup>3</sup>/ : -  
                          1000 s: (33,0...41,0)

Current A : 1,8

Control lever at full-load stop  
Speed rpm : 2500  
Rack travel in mm : 0,0...1,0

Current

short-duration A : 3,0  
Starting test  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000 s: 52,0 / 1,8A

Remarks:

Pin projection = 16.60...16.70 mm

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 15.3°...15.7°  
(15.2...15.8°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

\* Setting point for negative torque  
control - negative retainer behind

\*\* Reference measurement:

Control-rod travel and delivery too

Large - position spiral spring

Control-rod travel and delivery too

small - position spiral spring upwards

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.

With n = 335 1/min. and pu = 450 mbar,

control rod must move quickly to

control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 2,4 V4  
 Edition : 28.05.90  
 Replaces : 06.09.88  
 Test oil : ISO-4113

Combination no. : 0 400 074 924

Injection pump  
 Pump designation : PES4M55C320RS104-1  
 EP type number : 0 410 054 963  
 Governor  
 Governor design. : RSF375/2200M12-1  
 Governor no. : 0 420 021 064

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM616 -2.4 l-  
 1st version kW : 55.0

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
 : (1.65...1.85)

Rack travel in mm : 20.00...0.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.40...13.50

Del.quantity cm<sup>3</sup>/ : 3.7...3.8  
 100 s: (3.6...3.9)

Spread cm<sup>3</sup> : 0.2  
 100 s: (0.3)

2nd speed rpm : 375.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 0.6...0.7  
 100 s: (0.5...0.9)

Spread cm<sup>3</sup> : 0.1  
 100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del.quantity : 37.0...38.0  
 1000 : (36.0...39.0)

Spread cm<sup>3</sup> : 2.50  
 1000 : (3.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 50...0

3rd rack travel in: 6,5...6,9  
 Speed rpm : 2350

4th rack travel in: 2950  
 Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
 Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever  
 position degrees: 8...12

Setting point w/out bumper spring  
 Speed rpm : 375  
 Rack travel in mm : 6.6



Testing:

Speed rpm : 250  
 Minimum rack travel: 10.50  
 Speed rpm : 375  
 Rack travel in mm : 6.50...6.70  
 Rack travel in mm : 2.00  
 Speed rpm : 750...850  
 Speed rpm : 1000  
 Maximum rack travel: 1.50

SET IDLE AUXILIARY SPRING

Speed rpm : 450  
 Rack travel in mm : 5,1...5,3  
 : (5,0...5,4)

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
 Rack travel in m: 13.40...13.50  
 2nd speed rpm : 1600  
 Rack travel in m: 13.00...13.20  
 3rd speed rpm : 2100  
 Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1600  
 Del.quantity cm<sup>3</sup>/ : 38.5...40.5  
 1000 s: (37.5...41.5)  
 Spread cm<sup>3</sup> : 2.50  
 1000 s: (3.0)  
 Speed rpm : 2100  
 Del.quantity cm<sup>3</sup>/ : 37.5...39.5  
 1000 s: (36.5...40.5)  
 Spread cm<sup>3</sup> : 2.50  
 1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
 1000 s: (52.0...0.0)  
 Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version

Speed rpm : 2350  
 Rack travel in mm : 6.50...6.90  
 Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
 1000 s: (12.0...19.0)  
 Spread cm<sup>3</sup> : 2.50  
 1000 s: (3.00)

LOW IDLE

Speed rpm : 375  
 Rack travel in mm : 6.50...6.70  
 Del.quantity cm<sup>3</sup>/ : 6.0...7.0  
 1000 s: (5.5...9.0)  
 Spread cm<sup>3</sup> : 1.00  
 1000 s: (1.50)

Remarks:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
 Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
 With n = 375 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 4,1 d 1  
 Edition : 30.05.90  
 Replaces : 21.4.89  
 Test oil : ISO-4113

Combination no. : 0 400 864 062

Injection pump  
 Pump designation : PES4A85D410/3RS2638  
 EP type number : 0 410 884 950  
 Governor  
 Governor design. : RSV325...1150A2C707-  
 2L  
 Governor no. : 0 420 232 439

Customer-spec. information  
 Customer : KHD

Engine : BF4L913

1st version kw : 67.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 12.70...12.80  
 Del. quantity cm<sup>3</sup>/ : 8.1...8.2  
 100 s: (7.9...8.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.4)

2nd speed rpm : 325.0  
 Rack travel in mm : 8.1...8.3  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.8...1.8)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 700  
 Del. quantity : 81.5...82.5  
 1000 : (79.5...84.5)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (4.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 88...96

Testing:  
 1st rack travel in: 11.70  
 Speed rpm : 1040...1050  
 2nd rack travel in: 4.00  
 Speed rpm : 1110...1140

3rd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1340  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 8.10...8.30  
Rack travel in mm : 2.00  
Speed rpm : 640...700

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 500  
Rack travel in m: 13.70...13.80  
3rd speed rpm : 800  
Rack travel in m: 13.40...13.60  
4th speed rpm : 900  
Rack travel in m: 12.90...13.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 13.70...13.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.10...12.20  
2nd pressure hPa : 450  
Rack travel in m: 13.30...13.40  
3rd pressure hPa : 290  
Rack travel in m: 12.50...12.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 86.5...88.5  
1000 s: (84.0...91.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 61.5...63.5  
1000 s: (59.5...65.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 105.0...115.0  
1000 s: (102.0...118.0)  
Rack travel in mm : 17.10...17.30

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

#### APPLICATION

Installation 2300

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 6,1 u  
Edition : 21.05.90  
Replaces : 1.2.90  
Test oil : ISO-4113

Combination no. : 0 400 866 152

Injection pump  
Pump designation : PES6A85D410/3RS2783  
EP type number : 0 410 886 893  
Governor  
Governor design. : RSV325...1250A5C2239

Governer no. : 0 420 232 526

Customer-spec. information  
Customer : KHD

Engine : F6L912F

1st version kw : 82.0  
Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
: (2.90...3.10)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1235

Rack travel in mm : 11.80...11.90

Del.quantity cm3/ : 6.9...7.0

100 s: (6.7...7.2)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.4...7.6

Del.quantity cm3/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1235

Del.quantity : 69.5...70.5

1000 : (67.5...72.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 103...111

Testing:

1st rack travel in: 10.80

Speed rpm : 1275...1285

2nd rack travel in: 4.00

Speed rpm : 1330...1360

3rd rack travel in: 4.00

Speed rpm : 1345...1375  
4th rack travel in: 1510  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 420...480

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1235  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 750  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm3/ : 54.5...56.5  
1000 s: (52.0...59.0)  
Speed rpm : 1000  
Del.quantity cm3/ : 63.0...65.0  
1000 s: (60.5...67.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1275...1285

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 105.0...115.0  
1000 s: (102.0...118.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 7.40...7.60  
Del.quantity cm3/ : 8.0...14.0  
1000 s: (6.0...16.0)

Spread cm3 : 2.50  
1000 s: (4.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : HAN 10,8 f8
Edition : 17.05.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 401 076 010
Injection pump
Pump designation : PE6A100D32ORS3030-1
EP type number : 0 411 006 019
Governor
Governor design. : RSV350...1100A8C2232
-1R
Governor no. : 0 420 233 252

Customer-spec. information
Customer : HANOMAG

Engine : D964T

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 000
Inlet press., bar : 1.50
Test nozzle holder
assembly : 0 681 343 009
Opening
pressure, bar : 172...175
Test lines : 1 680 750 003
Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 1.80...1.90
: (1.75...1.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
& maximum rack tra: 21.00
Difference ° CS : 5.50...6.50

BASIC SETTING

1st speed rpm : 1080
Rack travel in mm : 10.70...10.80
Del.quantity cm3/ : 13.9...14.1
100 s: (13.7...14.3)
Spread cm3 : 0.3
100 s: (0.6)
2nd speed rpm : 350.0
Rack travel in mm : 6.1...6.3
Del.quantity cm3/ : 1.1...1.7
100 s: (0.8...1.9)
Spread cm3 : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1080
Aneroid pressure h: 700
Del.quantity : 139.0...141.0
1000 : (137.0...143.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 101...109

Testing:

1st rack travel in: 9.70  
Speed rpm : 1120...1130  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
3rd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1335  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 435...495

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1080  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 550  
Rack travel in m: 10.70...10.80  
5th speed rpm : 400  
Rack travel in m: 11.90...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 550  
Pressure hPa : -  
Rack travel mm : 9.20...9.30

Measurement

Speed 1/min : 550  
1st pressure hPa : 275  
Rack travel in m: 9.60...9.80  
2nd pressure hPa : 450  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 700  
Rack travel in m: 10.70...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 92.0...94.0  
1000 s: (90.0...96.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 9.70  
Speed rpm : 1120...1130

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...235.0  
1000 s: (217.0...238.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI 13,8 f  
 Edition : 02.01.90  
 Replaces : 23.6.89  
 Test oil : ISO-4113

Combination no. : 0 401 846 891

Injection pump  
 Pump designation : PE6P120A720RS3216  
 EP type number : 0 411 826 781  
 Governor  
 Governor design. : RQV300...975PA898K  
 Governor no. : 0 421 815 197

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8210.42.269

1st version kW : 261.0  
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 23.2...23.4

100 s: (22.9...23.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.4...4.6

Del.quantity cm<sup>3</sup>/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.60...2.00

2nd speed rpm : 400  
 travel mm : 3.20...4.00

3rd speed rpm : 750  
 travel mm : 6.70...7.10

4th speed rpm : 975  
 travel mm : 9.60...9.80

5th speed rpm : 1200  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1015

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975

Aneroid pressure h: 1200



Del.quantity : 232.0...234.0  
1000 : (229.0...237.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 11.80  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1085...1115  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 71...79

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.00  
Speed rpm : 300  
Rack travel in mm : 4.40...4.60

#### CONSTANT REGULATION

Speed rpm : 280...400

#### TORQUE CONTROL

Dimension a mm : 1.60  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 830  
Rack travel in m: 12.40...12.60  
3rd speed rpm : 500  
Rack travel in m: 11.30...11.50  
4th speed rpm : 350  
Rack travel in m: 11.20...11.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 975  
Pressure hPa : 1200  
Rack travel mm : 12.80...12.90

#### Measurement

Speed 1/min : 975

1st pressure hPa : -  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 700

Rack travel in m: 11.90...12.00  
3rd pressure hPa : 290  
Rack travel in m: 9.60...10.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 182.0...188.0  
1000 s: (179.0...191.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 109.0...111.0  
1000 s: (106.0...114.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1015...1025

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9a41  
 Edition : 12.01.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 036 080

Injection pump  
 Pump designation : PES6P120A720/3LS470-  
 2  
 EP type number : 0 412 026 050  
 Governor  
 Governor design. : RQ300/1100PA813-11  
 Governor no. : 0 421 801 514

Customer-spec. information  
 Customer : MAN

Engine : D2866LF

1st version kW : 243.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 20.2...20.4

100 s: (19.9...20.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 1000

Del.quantity : 202.0...204.0

1000 : (199.0...207.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.70  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack trave: 6.30  
Speed rpm : 300  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 340...380

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.70...10.90  
2nd speed rpm : 750  
Rack travel in m: 11.90...12.20  
3rd speed rpm : 875  
Rack travel in m: 11.80...12.00  
4th speed rpm : 950  
Rack travel in m: 11.20...11.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.10...11.20

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 85  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 280  
Rack travel in m: 10.50...10.90

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

A27

Aneroid pressure h: 1000  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 205.0...209.0  
1000 s: (202.0...212.0)  
Aneroid pressure h: 1000  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 198.0...204.0  
1000 s: (195.0...207.0)  
Aneroid pressure h: 280  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 184.0...196.0  
1000 s: (181.0...199.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 225.0...245.0  
1000 s: (221.0...249.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 12.0...18.0  
1000 s: (9.0...21.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 2-7756

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9 s  
 Edition : 12.06.90  
 Replaces :  
 Test oil : ISO-4113  
 Combination no. : 0 402 036 069  
 Injection pump  
 Pump designation : PES6P120A720LS470  
 EP type number : 0 412 026 046  
 Governor  
 Governor design. : RQ250/1050PA767  
 Governor no. : 0 421 801 311

Customer-spec. information  
 Customer : MAN

Engine : D2866LUE/DSB

1st version kW : 250.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.50...10.60

Del.quantity cm<sup>3</sup>/ : 19.8...20.0

100 s: (19.5...20.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250

Rack travel in mm : 5.2...5.4

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1000

Del.quantity : 198.0...200.0

1000 : (195.0...203.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.50

Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm<sup>a</sup> : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack trave: 6.80  
Speed rpm : 300  
Rack travel in mm : 5.20...5.40  
Rack travel in mm : 2.00  
Speed rpm : 315...355

#### TORQUE CONTROL

Dimension a mm : 0.55  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 750  
Rack travel in m: 12.00...12.10  
3rd speed rpm : 865  
Rack travel in m: 11.60...11.80  
4th speed rpm : 985  
Rack travel in m: 9.80...10.10

#### START CUT-OUT

Speed 1/min : 190 (210)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.60

\*Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 225.0...245.0  
1000 s: (221.0...249.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 12.0...18.0  
1000 s: (9.0...21.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

APPLICATION

Rail car

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,6 y 1  
 Edition : 08.06.90  
 Replaces : 2.5.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 076 722  
 Injection pump  
 Pump designation : PES6P120A72ORS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV400...1100P2A534  
 Governor no. : 0 421 833 275

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6076 HF

1st version kW : 194.0  
 2nd version kW : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 457 413 010  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00X3.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 12.00...12.10  
 Del.quantity cm<sup>3</sup>/ : 15.6...15.8  
 100 s : (15.4...16.1)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 4.8...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.2  
 100 s : (1.5...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (0.8)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 1200  
 Del.quantity : 156.5...158.5  
 1000 : (154.0...161.0)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (6.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 40...48

Testing:

1st rack travel in: 11.00  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 750  
Rack travel in m: 12.80...13.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : 605  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 780  
Rack travel in m: 12.10...12.50  
3rd pressure hPa : 1200  
Rack travel in m: 12.80...13.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 174.5...179.5  
1000 s: (172.0...182.0)  
Aneroid pressure h: -  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 117.5...121.5  
1000 s: (114.5...124.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: JOHN DEERE # RE32035

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,6 y  
 Edition : 09.07.90  
 Replaces : 2.5.90  
 Test oil : ISO-4113

Combination no. : 0 402 076 723

Injection pump  
 Pump designation : PES6P120A72ORS3203  
 EP type number : 0 412 026 728  
 Governor  
 Governor design. : RSV400...1100P2A534-  
 1

Governer no. : 0 421 833 276

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6466 AF-050

1st version kW : 180.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.80...11.90

Del.quantity cm<sup>3</sup>/ : 15.0...15.2

100 s : (14.7...15.4)

Spread cm<sup>3</sup> : 0.4

100 s : (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/ : 1.7...2.2

100 s : (1.5...2.5)

Spread cm<sup>3</sup> : 0.6

100 s : (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 150.0...152.0

1000 : (147.5...154.5)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 40...48



Testing:

1st rack travel in: 10.80  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 700  
Rack travel in m: 12.60...12.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 12.60...12.80

Measurement

Speed 1/min : 500  
1st pressure hPa : -  
Rack travel in m: 10.40...10.60  
2nd pressure hPa : 720  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 895  
Rack travel in m: 11.80...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm3/ : 173.5...178.5  
1000 s: (171.0...181.0)  
Aneroid pressure h: -  
Speed rpm : 800  
Del.quantity cm3/ : 120.0...124.0  
1000 s: (117.0...127.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm3 : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE32033

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 b  
Edition : 17.05.90  
Replaces : 2.5.90  
Test oil : ISO-4113  
  
Combination no. : 0 402 076 727  
  
Injection pump  
Pump designation : PES6P120A720RS3203  
EP type number : 0 412 026 728  
Governor  
Governor design. : RSV400...1100P2A534-  
2  
Governor no. : 0 421 833 290

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6076AF

1st version kW : 168.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 15.3...15.5

100 s: (15.1...15.7)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 153.5...155.5

1000 : (151.5...157.5)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 11.00  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1195...1205  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.4

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 700  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.00...13.20

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 510  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 645  
Rack travel in m: 12.40...12.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 178.5...182.5  
1000 s: (176.5...184.5)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm3/ : 138.5...142.5  
1000 s: (136.5...144.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm3 : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE32034

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 10,1 i  
 Edition : 17.05.90  
 Replaces : 1.2.90  
 Test oil : ISO-4113

Combination no. : 0 402 076 735

Injection pump  
 Pump designation : PES6P110A72ORS3242  
 EP type number : 0 412 016 731  
 Governor  
 Governor design. : RSV400...1050POA513-  
 1  
 Governor no. : 0 421 833 327

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6619AE03

1st version kw : 212.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 200...215

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55  
 : (3.40...3.60)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 20.8...21.0  
 100 s: (20.5...21.2)

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.8...7.0  
 Del.quantity cm<sup>3</sup>/ : 4.0...4.5  
 100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.9  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 800  
 Del.quantity : 208.0...210.0  
 1000 : (205.5...212.5)

Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version

Control Lever  
position degrees: 37...45

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1170  
3rd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control Lever  
position degrees: 17...25  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 6.80...7.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 14.00...14.20  
2nd speed rpm : 600  
Rack travel in m: 14.20...14.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 800  
Rack travel mm : 14.20...14.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.40...11.60  
2nd pressure hPa : 350  
Rack travel in m: 13.40...13.50  
3rd pressure hPa : 170  
Rack travel in m: 12.10...12.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 222.0...227.0  
1000 s: (219.5...229.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 144.5...148.5  
1000 s: (141.5...151.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...175.0  
1000 s: (140.0...180.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.80...7.00  
Del.quantity cm<sup>3</sup>/ : 40.0...45.0  
1000 s: (37.5...47.5)  
Spread cm<sup>3</sup> : 9.00  
1000 s: (12.00)

#### Remarks:

: JOHN DEERE # RE42224  
Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 14° angular  
displacement of the cam after start of  
delivery of cylinder 1 with control-rod  
travel = 10.50 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 10,1 j  
 Edition : 17.05.90  
 Replaces : 2.5.90  
 Test oil : ISO-4113

Combination no. : 0 402 076 738

Injection pump  
 Pump designation : PES6P110A72ORS3251  
 EP type number : 0 412 016 733  
 Governor  
 Governor design. : RSV400...1050POA513-  
 1  
 Governor no. : 0 421 833 327

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6619AE03

1st version kW : 212.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 200...215

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55  
 : (3.40...3.60)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.70...12.80

Del.quantity cm<sup>3</sup>/ : 19.6...19.8  
 100 s: (19.4...20.0)

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm<sup>3</sup>/ : 3.2...3.7  
 100 s: (3.0...3.9)

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 900  
 Del.quantity : 196.5...198.5  
 1000 : (194.5...200.5)

Spread cm<sup>3</sup> : 4.00  
 1000 : (6.50)

RATED SPEED

1st version

Control Lever  
position degrees: 40...48

Testing:

1st rack travel in: 11.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1170  
3rd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.30...5.50

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 600  
Rack travel in m: 13.70...13.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 475  
Rack travel in m: 12.70...12.80  
3rd pressure hPa : 225  
Rack travel in m: 10.80...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 236.5...240.5  
1000 s: (234.5...242.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 144.0...148.0  
1000 s: (142.0...150.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...210.0  
1000 s: (175.0...215.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 32.0...37.0  
1000 s: (30.0...39.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE42224  
Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 14° angular  
displacement of the cam after start of  
delivery of cylinder 1 with control-rod  
travel = 10.50 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : BAO 31,8 c3  
 Edition : 29.05.90  
 Replaces : 1.2.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 630 805  
 Injection pump  
 Pump designation : PE12P120A120RS7106  
 EP type number : 0 412 620 800  
 Governor  
 Governor design. : RQV350...900PA935-1  
 Governor no. : 0 421 813 820

Customer-spec. information  
 Customer : BAUDOUIN

Engine : V12P15-2

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 074  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 12- 9- 4- 5- 8-  
 11- 2- 3- 10- 7- 6

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 12.00...12.10  
 Del.quantity cm<sup>3</sup>/ : 33.9...34.1  
 100 s: (33.6...34.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.6...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.70  
 2nd speed rpm : 500  
 travel mm : 3.00...3.60  
 3rd speed rpm : 700  
 travel mm : 5.30...5.90  
 4th speed rpm : 900  
 travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 930  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Del.quantity : 339.0...341.0  
 1000 : (336.0...344.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)



RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 11.00  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 86...94

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.30  
Speed rpm : 350  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00

CONSTANT REGULATION  
Speed rpm : 330...450

START CUT-OUT

Speed 1/min : 270 (290)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 940...950

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 12,9 c  
 Edition : 02.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 636 800  
 Injection pump  
 Pump designation : PE6P130A720/3LS7827  
 EP type number : 0 412 636 814  
 Governor  
 Governor design. : RQV400...1150PA937  
 Governor no. : 0 421 813 823

Customer spec. information  
 Customer : IVECO-FIAT

Engine : 8262.43.001

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.10...5.20  
 : (5.05...5.25)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 11.70...11.80  
 Del.quantity cm<sup>3</sup>/ : 26.8...27.1  
 100 s: (26.4...27.4)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)  
 2nd speed rpm : 400.0  
 Rack travel in mm : 4.8...5.2  
 Del.quantity cm<sup>3</sup>/ : 2.1...2.7  
 100 s: (1.7...3.1)  
 Spread cm<sup>3</sup> : 1.0  
 100 s: (1.4)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
 travel mm : 2.60...3.00  
 2nd speed rpm : 500  
 travel mm : 4.20...4.80  
 3rd speed rpm : 650  
 travel mm : 5.80...6.40  
 4th speed rpm : 900  
 travel mm : 6.70...7.00  
 5th speed rpm : 1350  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 850  
 Rack travel in mm : 16.50...18.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 1200  
 Del.quantity : 268.0...271.0  
 1000 : (264.5...274.5)

Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 106...114

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 400...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 11.70...11.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.70...8.90  
2nd pressure hPa : 650  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 250  
Rack travel in m: 9.20...9.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 275.0...282.0  
1000 s: (275.0...282.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 165.0...168.0  
1000 s: (161.5...171.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1190...1200

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 21.0...27.0  
1000 s: (17.0...31.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.00)

Remarks:

APPLICATION

Special-purpose vehicle

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 16,3 b  
 Edition : 02.02.90  
 Replaces : 2.10.89  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 638 803  
  
 Injection pump  
 Pump designation : PE8P120A12ORS7141  
 EP type number : 0 412 628 823  
 Governor  
 Governor design. : RQ750PA871  
 Governor no. : 0 421 801 404

Customer-spec. information  
 Customer : PERKINS

Engine : CV8-320 G

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve  
 : 1 417 413 025  
  
 Inlet press., bar : 1.50  
  
 Test nozzle holder  
 assembly : 1 688 901 019  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,8  
  
 Test lines : 1 680 750 067  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000  
  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
 Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 6- 5- 4- 8-  
7- 2

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.40...14.50

Del.quantity cm<sup>3</sup>/ : 33.3...33.5

100 s: (33.0...33.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 7.5...7.7

Del.quantity cm<sup>3</sup>/ : 3.6...4.2

100 s: (3.3...4.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Del.quantity : 333.0...335.0

1000 : (330.0...338.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 77...85

### Testing:

1st rack travel in: 13.40

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 795...805

4th rack travel in: 900

Speed rpm : 0.00...1.00

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 750...755

Remarks:

:

APPLICATION

Generator



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 21,9 x  
 Edition : 12.02.90  
 Replaces : 9.3.87  
 Test oil : ISO-4113

Combination no. : 0 402 640 804

Injection pump  
 Pump designation : PE12P120A320LS7807  
 EP type number : 0 412 620 806  
 Governor  
 Governor design. : RQV350...1050PA842  
 Governor no. : 0 421 813 587

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 A

1st version kW : 390.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.50...13.70

Del. quantity cm<sup>3</sup>/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.7

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.90...2.10

2nd speed rpm : 700  
 travel mm : 4.00...4.40

3rd speed rpm : 1100  
 travel mm : 6.80...7.20

4th speed rpm : 1200  
 travel mm : 8.30...8.70

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 660  
Del.quantity : 199.0...201.0  
1000 : (196.0...204.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

#### Testing:

1st rack travel in: 11.00  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 10...18

#### Testing:

Speed rpm : 100  
Minimum rack trave: 7.10  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 400...600

#### TORQUE CONTROL

Dimension a mm : 1.50  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.00...12.20  
2nd speed rpm : 975  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 875  
Rack travel in m: 13.20...13.40  
4th speed rpm : 700  
Rack travel in m: 13.50...13.70

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 660  
Rack travel mm : 13.50...13.70

#### Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 500  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : -  
Rack travel in m: 10.40...10.60

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 170.0...174.0  
1000 s: (167.0...177.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 204.0...208.0  
1000 s: (201.0...211.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s: (147.0...157.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.74

Del.quantity cm<sup>3</sup>/ : 16.0...22.0  
1000 s: (13.0...22.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:





BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 21,9 v 1  
 Edition : 04.05.90  
 Replaces : 24.8.87  
 Test oil : ISO-4113

Combination no. : 0 402 640 806

Injection pump  
 Pump designation : PE12P120A320LS7806  
 EP type number : 0 412 620 805  
 Governor  
 Governor design. : RQV350...1000PA835-1  
 Governor no. : 0 421 813 590

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 419.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 : 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.30...13.50

Del.quantity cm<sup>3</sup>/ : 18.7...18.9

100 s: (18.4...19.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.90...2.10

2nd speed rpm : 700  
 travel mm : 4.90...5.30

3rd speed rpm : 1050  
 travel mm : 8.00...8.40

4th speed rpm : 1200  
 travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1050

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 650  
Del.quantity : 187.0...189.0  
1000 : (184.0...192.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 11.70  
Speed rpm : 1045...1060  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 64...72

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.50  
Speed rpm : 350  
Rack travel in mm : 5.90...6.30

#### CONSTANT REGULATION

Speed rpm : 400...600

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 13.30...13.50

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 420  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 500  
Rack travel in m: 10.60...10.90

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

B22

1st version  
Aneroid pressure h: 650  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 182.0...186.0  
1000 s: (179.0...189.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 650  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 196.0...200.0  
1000 s: (193.0...203.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (122.0...132.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1045...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...190.0  
1000 s: (166.0...194.0)

Remarks:

:

#### APPLICATION

Rail car

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 22,0 b  
 Edition : 02.02.90  
 Replaces : 7.7.89  
 Test oil : ISO-4113

Combination no. : 0 402 640 812

Injection pump  
 Pump designation : PE12P120A520LS7820  
 EP type number : 0 412 620 814  
 Governor  
 Governor design. : RQV350...1150PA870-4  
 Governor no. : 0 421 813 717

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kw : 736.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.30...14.40

Del.quantity cm<sup>3</sup>/ : 31.2...31.4

100 s: (30.9...31.7)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...6.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.90...2.40

2nd speed rpm : 500

travel mm : 3.00...3.50

3rd speed rpm : 800

travel mm : 4.30...4.80

4th speed rpm : 1200

travel mm : 8.30...8.80

5th speed rpm : 1250

travel mm : 9.30...9.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 1800  
Del.quantity : 312.0...314.0  
1000 : (309.0...317.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

RATED SPEED

1st version

Control lever  
position degrees: 113...121

Testing:

1st rack travel in: 13.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 62...70

Testing:

Speed rpm : 250  
Minimum rack trave: 7.00  
Speed rpm : 350  
Rack travel in mm : 5.00...5.60

CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 7.80...8.10

Measurement

Speed 1/min : 500  
1st pressure hPa : 300  
Rack travel in m: 9.10...9.20  
2nd pressure hPa : 1100  
Rack travel in m: 13.40...13.70

START CUT-OUT

Speed 1/min : 310 (330)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1800  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 303.0...313.0  
1000 s: (300.0...316.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (15.0)  
Aneroid pressure h: 1800  
Speed rpm : 1150  
Del.quantity cm<sup>3</sup>/ : 240.0...243.0 \*  
1000 s: (237.0...246.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (15.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 124.0...126.0  
1000 s: (121.0...129.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (15.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 330.0...350.0  
1000 s: (326.0...354.0)

Remarks:

:

\* = Set at reduced-delivery stop.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MAN 21,0 b2  
 Edition : 17.05.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 640 815

Injection pump  
 Pump designation : PE12P120A520LS7824  
 EP type number : 0 412 620 816  
 Governor  
 Governor design. : RQV250...1150PA902-4  
 Governor no. : 0 421 813 870

Customer-spec. information  
 Customer : MAN

Engine : D2842LYE

1st version kW : 735.0  
 Rated speed : 2300

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

### BASIC SETTING

1st speed rpm : 1150

---

Rack travel in mm : 13.60...13.70

---

Del. quantity cm<sup>3</sup>/ : 30.1...30.3  
 100 s : (29.8...30.6)

---

Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 500  
 Rack travel in mm : 9.10...9.30  
 Del. quantity cm<sup>3</sup>/ : 14.9...15.1  
 100 s : (14.6...15.4)

Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

3rd speed rpm : 300  
 Rack travel in mm : 7.20...7.40  
 Del. quantity cm<sup>3</sup>/ : 5.2...6.0 \*  
 100 s : (-)

Spread cm<sup>3</sup> : -  
 100 s : (-)

(B) Setting of injection pump  
 with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.60  
 2nd speed rpm : 450  
 travel mm : 2.90...3.50  
 3rd speed rpm : 750  
 travel mm : 5.60...6.00  
 4th speed rpm : 1150  
 travel mm : 9.50...9.70  
 5th speed rpm : 1400  
 travel mm : 13.00...14.00

### GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1200  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h : 1300  
Del.quantity : 301.0...303.0  
1000 : (298.0...306.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 12.60  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 79...87

Testing:

Speed rpm : 100  
Minimum rack trave: 8.90  
Speed rpm : 300  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.60...13.70

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 100  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 470  
Rack travel in m: 12.00...12.40

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)  
Rack travel in mm : 17.50

HIGH IDLE

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Rack travel in mm : < 7.00  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)

2nd version

Aneroid pressure h: -  
Speed rpm : 500  
Rack travel in mm : < 7.50  
Del.quantity cm<sup>3</sup>/ : < 50.0  
1000 s: (-)

3rd version

Aneroid pressure h: -  
Speed rpm : 500  
Rack travel in mm : 8.50  
Del.quantity cm<sup>3</sup>/ : 125.0  
1000 s: (-)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.20...7.40  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0  
1000 s: (-)

Remarks:

: MAN-NR. 2-7960

\* applies to cylinders 4, 5, 6, 8, 10  
and 12  
\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

APPLICATION

Ship



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 21,0 b1  
 Edition : 26.06.90  
 Replaces : 7.7.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 816  
 Injection pump  
 Pump designation : PE12P120A520LS7824  
 EP type number : 0 412 620 816  
 Governor  
 Governor design. : RQV250...1150PA902-3  
 Governor no. : 0 421 813 761

Customer-spec. information  
 Customer : MAN

Engine : D2842LXE

1st version kW : 662.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 : 4- 11- 10- 2- 6- 7  
 Phasing : 0-45-60-105-120-165-  
 : 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 12.00...12.10  
 Del.quantity cm3/ : 24.9...25.1  
 100 s: (24.6...25.4)  
 Spread cm3 : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 500  
 Rack travel in mm : 8.90...9.10  
 Del.quantity cm3/ : 14.9...15.1  
 100 s: (14.6...15.4)  
 Spread cm3 : 0.8  
 100 s: (1.2)  
 3rd speed rpm : 250  
 Rack travel in mm : 7.30...7.50  
 Del.quantity cm3/ : 5.2...6.0 \*  
 100 s: (-)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.90...1.10  
 2nd speed rpm : 450  
 travel mm : 2.90...3.50  
 3rd speed rpm : 750  
 travel mm : 5.50...5.90  
 4th speed rpm : 1150  
 travel mm : 9.20...9.40  
 5th speed rpm : 1400  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1225  
 Rack travel in mm : 15.20...17.80



FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 249.0...251.0  
1000 : (246.0...254.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 58...66

Testing:

1st rack travel in: 11.00  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1275...1315  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 16...24

Testing:

Speed rpm : 100  
Minimum rack trave: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.20...13.30

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 100  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 400  
Rack travel in m: 11.30...11.70

START CUT-OUT

Speed 1/min : 170 (190)

C01

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)  
Rack travel in mm : 17.50

HIGH IDLE

1st version

Speed rpm : 500\*\*  
Rack travel in mm : <7.00...0.00  
Del.quant<sup>ty</sup> cm<sup>3</sup>/ : <0  
1000 s: (-)

2nd version

Speed rpm : 500\*\*  
Rack travel in mm : <7.50  
Del.quantity cm<sup>3</sup>/ : <50.0  
1000 s: (-)

3rd version

Speed rpm : 500  
Rack travel in mm : 8.20  
Del.quantity cm<sup>3</sup>/ : 125.0  
1000 s: (-)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0 \*  
1000 s: (-)

Remarks:

: MAN-NR. 2-7959

\* applies to cylinders 4, 5, 6, 8, 10  
and 12

\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

APPLICATION

Ship



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 22,0 c  
 Edition : 02.02.90  
 Replaces : 1.9.89  
 Test oil : ISO-4113

Combination no. : 0 402 640 817

Injection pump  
 Pump designation : PE12P120A520LS7826  
 EP type number : 0 412 620 817  
 Governor  
 Governor design. : RQV350...1150PA870-4  
 Governor no. : 0 421 813 717

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 736.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 15.20...15.30

Del.quantity cm<sup>3</sup>/ : 31.2...31.4

100 s: (30.9...31.7)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.90...2.40

2nd speed rpm : 500  
 travel mm : 3.00...3.50

3rd speed rpm : 800  
 travel mm : 4.30...4.80

4th speed rpm : 1200  
 travel mm : 8.30...8.80

5th speed rpm : 1250  
 travel mm : 9.30...9.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 1800  
Del.quantity : 312.0...314.0  
1000 : (309.0...317.0)  
Spread cm3 : 6.00  
1000 : (10.00)

RATED SPEED

1st version

Control lever  
position degrees: 113...121

Testing:

1st rack travel in: 14.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 62...70

Testing:

Speed rpm : 250  
Minimum rack trave: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.30...5.90

CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.20...8.50

Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 9.60...9.70  
2nd pressure hPa : 1100  
Rack travel in m: 13.80...14.10

START CUT-OUT

Speed 1/min : 310 (330)

FUEL DELIVERY CHARACTERISTICS

CO4

1st version

Aneroid pressure h: 1800  
Speed rpm : 750  
Del.quantity cm3/ : 303.0...313.0  
1000 s: (300.0...316.0)  
Spread cm3 : 10.00  
1000 s: (15.0)  
Aneroid pressure h: 1800  
Speed rpm : 1150  
Del.quantity cm3/ : 240.0...243.0 \*  
1000 s: (237.0...246.0)  
Spread cm3 : 10.00  
1000 s: (15.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 124.0...126.0  
1000 s: (121.0...129.0)  
Spread cm3 : 10.00  
1000 s: (15.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.20  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 330.0...350.0  
1000 s: (326.0...354.0)

Remarks:

:

\* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 21,0 e  
 Edition : 01.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 818  
 Injection pump  
 Pump designation : PE12P120A520LS7829  
 EP type number : 0 412 620 821  
 Governor  
 Governor design. : RQV250...1150PA943  
 Governor no. : 0 421 813 850

Customer-spec. information  
 Customer : MAN

Engine : D2842LZE

1st version kW : 809.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 13.80...13.90  
 Del.quantity cm3/ : 30.4...30.6  
 100 s: (30.1...30.9)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 500  
 Rack travel in mm : 9.10...9.30  
 Del.quantity cm3/ : 14.9...15.1  
 100 s: (14.6...15.4)  
 Spread cm3 : 0.8  
 100 s: (1.2)  
 3rd speed rpm : 250  
 Rack travel in mm : 7.30...7.50  
 Del.quantity cm3/ : 5.2...5.6 \*  
 100 s: (-)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.80...1.20  
 2nd speed rpm : 450  
 travel mm : 2.90...3.50  
 3rd speed rpm : 750  
 travel mm : 5.50...5.90  
 4th speed rpm : 1150  
 travel mm : 9.20...9.40  
 5th speed rpm : 1400  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1225  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 304.0...306.0  
1000 : (301.0...309.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 12.80  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 78...82

Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50

CONSTANT REGULATION

Speed rpm : 280...410

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 500  
1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 100  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 470  
Rack travel in m: 12.00...12.40

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.80  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)  
Rack travel in mm : 17.50

HIGH IDLE

1st version

Speed rpm : 500  
Rack travel in mm : < 7.00  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)

2nd version

Speed rpm : 500  
Rack travel in mm : < 7.50  
Del.quantity cm<sup>3</sup>/ : < 50.0  
1000 s: (-)

3rd version

Speed rpm : 500  
Rack travel in mm : 8.10...8.30  
Del.quantity cm<sup>3</sup>/ : 125.0  
1000 s: (-)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0 \*  
1000 s: (-)

Remarks:

: MAN-NR. 3-7023

\* applies to cylinders 4, 5, 6, 8, 10  
and 12

\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

APPLICATION

Ship



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 21,0 e1  
 Edition : 17.05.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 818  
 Injection pump  
 Pump designation : PE12P120A520LS7829  
 EP type number : 0 412 620 821  
 Governor  
 Governor design. : RQV250...1150PA943-1  
 Governor no. : 0 421 813 869

Customer-spec. information  
 Customer : MAN

Engine : D2842LZE

1st version kW : 809.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test Lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 Phasing : 345  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 13.80...13.90  
 Del.quantity cm3/ : 30.4...30.6  
 100 s : (30.1...30.9)  
 Spread cm3 : 0.5  
 100 s : (0.9)

2nd speed rpm : 500  
 Rack travel in mm : 9.10...9.30  
 Del.quantity cm3/ : 14.9...15.1  
 100 s : (14.6...15.4)  
 Spread cm3 : 0.8  
 100 s : (1.2)  
 3rd speed rpm : 250  
 Rack travel in mm : 7.30...7.50  
 Del.quantity cm3/ : 5.2...5.6 \*  
 100 s : (-)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.60  
 2nd speed rpm : 450  
 travel mm : 2.90...3.50  
 3rd speed rpm : 750  
 travel mm : 5.70...6.10  
 4th speed rpm : 1150  
 travel mm : 9.50...9.70  
 5th speed rpm : 1400  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1225  
 Rack travel in mm : 15.20...17.80



FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 304.0...306.0  
1000 : (301.0...309.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 12.80  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 79...87

Testing:

Speed rpm : 100  
Minimum rack travel: 8.90  
Speed rpm : 250  
Rack travel in mm : 7.30...7.50

CONSTANT REGULATION

Speed rpm : 280...410

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1300  
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 100  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 470  
Rack travel in m: 12.00...12.40

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0 \*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)  
Rack travel in mm : 17.50

HIGH IDLE

1st version

Speed rpm : 500  
Rack travel in mm : < 7.00  
Del.quantity cm<sup>3</sup>/ : - \*\*  
1000 s: (-)

2nd version

Speed rpm : 500  
Rack travel in mm : < 7.50  
Del.quantity cm<sup>3</sup>/ : < 50.0  
1000 s: (-)

3rd version

Speed rpm : 500  
Rack travel in mm : 8.10...8.30  
Del.quantity cm<sup>3</sup>/ : 125.0  
1000 s: (-)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 52.0...60.0 \*  
1000 s: (-)

Remarks:

: MAN-NR. 3-7023

\* applies to cylinders 4, 5, 6, 8, 10  
and 12

\*\* applies for cylinders 1, 2, 3, 7, 9  
and 11

APPLICATION

Ship



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 21,9 x 2  
 Edition : 01.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 819  
 Injection pump  
 Pump designation : PE12P120A320LS7807-3  
 EP type number : 0 412 620 822  
 Governor  
 Governor design. : RGV350...1050PA842-6  
 Governor no. : 0 421 813 853

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 A

1st version kW : 390.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.50...13.70

Del. quantity cm<sup>3</sup>/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.90...2.10

2nd speed rpm : 700

travel mm : 4.00...4.40

3rd speed rpm : 1100

travel mm : 6.80...7.20

4th speed rpm : 1200

travel mm : 8.30...8.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 660  
Del.quantity : 199.0...201.0  
1000 : (196.0...204.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.10  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 400...600

TORQUE CONTROL  
Dimension a mm : 1.30  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.20...12.40  
2nd speed rpm : 975  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 875  
Rack travel in m: 13.20...13.40  
4th speed rpm : 700  
Rack travel in m: 13.50...13.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 660  
Rack travel mm : 13.50...13.70

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 500  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 830  
Rack travel in m: 13.70...13.80  
4th pressure hPa : 1150  
Rack travel in m: 13.70...13.90  
5th pressure hPa : -  
Rack travel in m: 10.40...10.60

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 170.0...174.0  
1000 s: (167.0...177.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 204.0...208.0  
1000 s: (201.0...211.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s: (147.0...157.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 22,0 e  
 Edition : 17.05.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 640 820  
 Injection pump  
 Pump designation : PE12P120A320LS7814-2  
 EP type number : 0 412 620 824  
 Governor  
 Governor design. : RQ750PA966  
 Governor no. : 0 421 801 535

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 535.0  
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.90...15.00

Del.quantity cm<sup>3</sup>/ : 31.6...31.8

100 s: (31.3...32.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.6...5.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 316.0...318.0

1000 : (313.0...321.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 88...96

Testing:

1st rack travel in: 13.90

Speed rpm : 755...760

2nd rack travel in: 4.00

Speed rpm : 780...790

Speed rpm : 0.00...1.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 755...760

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11, Du11  
 Edition : 16.02.90  
 Replaces : 9.3.87  
 Test oil : ISO-4113

Combination no. : 0 402 646 819

Injection pump  
 Pump designation : PE6P120A72ORS7001  
 EP type number : 0 412 626 800  
 Governor  
 Governor design. : RQ200/1100PA713  
 Governor no. : 0 421 801 262

Customer spec. information  
 Customer : SCANIA

Engine : DS11 25,26

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.70...11.80

Del.quantity cm<sup>3</sup>/ : 16.1...16.3

100 s: (15.8...16.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.8)

2nd speed rpm : 225.0

Rack travel in mm : 4.6...5.2

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 161.0...163.0

1000 : (158.0...166.0)

Spread cm<sup>3</sup> : 5.00

1000 : (8.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.5

Testing:

1st rack travel in: 10.70

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1290...1320



4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.90  
Speed rpm : 225  
Rack travel in mm : 4.40...4.60  
Rack travel in mm : 2.00  
Speed rpm : 300...340

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.70...11.80

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 220  
Rack travel in m: 11.40...11.50  
3rd pressure hPa : 190  
Rack travel in m: 10.90...11.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 120.0...124.0  
1000 s: (118.0...126.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)

Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.40...4.60

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on May 17, 1984

Start of delivery - engine:  
DS11 25 - 15° before TDC  
DS11 26 - 11° before TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 9,0 h  
 Edition : 16.02.90  
 Replaces : 9.3.87  
 Test oil : ISO-4113

Combination no. : 0 402 646 824

Injection pump  
 Pump designation : PE6P120A32ORS7111  
 EP type number : 0 412 626 809  
 Governor  
 Governor design. : RQ750PA758  
 Governor no. : 0 421 801 297

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS 9 46,47

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 17.7...17.9

100 s: (17.4...18.2)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 177.0...179.0

1000 : (174.0...182.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.5

Testing:

1st rack travel in: 11.30

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 784...797

4th rack travel in: 850

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 750...755

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### HIGH IDLE

1st version  
Rack travel in mm : 5.80...6.00  
Spread cm<sup>3</sup> : 4.00  
1000 s: (7.00)

Remarks:

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
1987-01-08

Start-of-delivery mark is at 15°  
angular displacement of the cam after  
start of delivery at cylinder 1 with  
control-rod travel 9.00...12.00 mm

Firing sequence of engine:  
1-5-3-6-2-4.

#### APPLICATION

Generator

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 16,0 a
Edition : 16.02.90
Replaces : 10.2.89
Test oil : ISO-4113
Combination no. : 0 402 646 832
Injection pump
Pump designation : PE6P130A72ORS7122
EP type number : 0 412 636 804
Governor
Governor design. : RQV225...930PA799
Governor no. : 0 421 813 544

Customer-spec. information
Customer : VOLVO

Engine : TD162 FS

1st version kW : 343.0
Rated speed : 1860

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70
: (3.55...3.75)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.30 (0.75)
Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
Rack travel in mm : 12.90...13.00
Del.quantity cm3/ : 27.4...27.7
100 s: (27.1...28.1)
Spread cm3 : 0.6
100 s: (1.0)

2nd speed rpm : 250.0
Rack travel in mm : 5.0...5.2
Del.quantity cm3/ : 2.5...3.0
100 s: (2.3...3.3)
Spread cm3 : 0.5
100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 1.00...1.40
2nd speed rpm : 350
travel mm : 2.10...2.70
3rd speed rpm : 700
travel mm : 6.40...6.60
4th speed rpm : 960
travel mm : 7.60...7.80
5th speed rpm : 1045
travel mm : 9.00...9.40

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1010
Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Aneroid pressure h: 700

Del.quantity : 274.5...277.5  
1000 : (271.0...281.0)  
Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

#### Testing:

1st rack travel in: 11.90  
Speed rpm : 960...972  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 61...69

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 225...400

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.90...13.00

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 80  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 540  
Rack travel in m: 12.50...12.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 182.5...185.5  
1000 s: (179.0...189.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 960...972

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...145.0  
1000 s: (-)  
Rack travel in mm : 9.70...9.80

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.00...5.20  
Del.quantity cm3/ : 25.5...30.5  
1000 s: (23.0...33.0)  
Spread cm3 : 5.00  
1000 s: (8.00)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t  
 Edition : 16.02.90  
 Replaces : 5.8.88  
 Test oil : ISO-4113

Combination no. : 0 402 646 838

Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQ300/1050PA762-4  
 Governor no. : 0 421 801 390

Customer spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kw : 240.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.70  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL  
Dimension a mm : 0.30  
2nd speed rpm : 1050  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 800  
Rack travel in m: 15.10...15.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 550  
Rack travel in m: 12.70...12.90  
3rd pressure hPa : 1050  
Rack travel in m: 14.00...14.10 \*  
4th pressure hPa : 1150  
Rack travel in m: 14.40...14.70  
5th pressure hPa : -  
Rack travel in m: 9.50...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1350  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 236.0...239.0  
1000 s: (233.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 243.0...247.0  
1000 s: (240.0...250.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.70  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 205.0...225.0  
1000 s: (201.0...229.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t 2  
 Edition : 30.03.90  
 Replaces : 25.3.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 843  
 Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQV300...1050PA797-2  
 Governor no. : 0 421 813 614

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 240.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.20...1.40

2nd speed rpm : 600

travel mm : 4.90...5.10

3rd speed rpm : 1075

travel mm : 7.40...7.60

4th speed rpm : 1100

travel mm : 8.00...8.40

5th speed rpm : 1150

travel mm : 9.00...9.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.80...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



1st version  
Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 211.0...213.0  
1000 : (208.0...216.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.80  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 81...89

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.90  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 0.30  
2nd speed rpm : 1050  
Rack travel in m: 14.80...15.00  
3rd speed rpm : 800  
Rack travel in m: 15.00...15.20  
4th speed rpm : 700

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.90...14.10

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 550  
Rack travel in m: 12.80...13.10

3rd pressure hPa : 1050  
Rack travel in m: 14.00...14.10 \*  
4th pressure hPa : 1150  
Rack travel in m: 14.40...14.60  
5th pressure hPa : -  
Rack travel in m: 9.00...9.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1450  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 236.0...239.0  
1000 s: (233.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1450  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 242.0...246.0  
1000 s: (239.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 133.0...135.0  
1000 s: (130.0...138.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)  
Rack travel in mm : 200.00...220.00

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 d  
 Edition : 12.01.90  
 Replaces : 10.2.89  
 Test oil : ISO-4113

Combination no. : 0 402 646 844

Injection pump  
 Pump designation : PE6P120A72ORS7017  
 EP type number : 0 412 626 818  
 Governor  
 Governor design. : RQV200...1000PA539-7  
 Governor no. : 0 421 813 631

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC 11 12

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 14.50...14.60

---

Del.quantity cm<sup>3</sup>/ : 22.0...22.2

---

100 s: (21.7...22.5)

---

Spread cm<sup>3</sup> : 0.6

---

100 s: (0.9)

---

2nd speed rpm : 225.0  
 Rack travel in mm : 5.3...5.7  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s: (-)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60

2nd speed rpm : 350  
 travel mm : 2.40...3.00

3rd speed rpm : 650  
 travel mm : 4.50...5.10

4th speed rpm : 1045  
 travel mm : 8.40...8.60

5th speed rpm : 1165  
 travel mm : 10.00...10.40

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1

Speed rpm : 1050  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 220.0...222.0  
 1000 : (217.0...225.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 62...70

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 225  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 380...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.30...12.70  
2nd pressure hPa : 480  
Rack travel in m: 14.10...14.20  
3rd pressure hPa : 285  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 210.0...218.0  
1000 s: (208.0...220.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 169.0...173.0  
1000 s: (167.0...175.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 5.30...5.50

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine: 16° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 c
Edition : 12.02.90
Replaces : 10.2.89
Test oil : ISO-4113
Combination no. : 0 402 646 845
Injection pump
Pump designation : PE6P120A720RS7139
EP type number : 0 412 626 819
Governor
Governor design. : RQV200...1000PA725-2
Governor no. : 0 421 813 632

Customer-spec. information
Customer : SAAB-SCANIA

Engine : DSC11 13

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 019
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test lines : 1 680 750 015
Outside diameter x Wall thickness x Length mm : 6.00X1.50X600
(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 5.00...5.10
: (4.95...5.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
Rack travel in mm : 15.20...15.30
Del.quantity cm3/ : 23.6...23.8
100 s: (23.3...24.1)
Spread cm3 : 0.6
100 s: (0.9)
2nd speed rpm : 225.0
Rack travel in mm : 5.3...5.7
Del.quantity cm3/ : 1.8...2.2
100 s: (-)
Spread cm3 : 0.3
100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225
travel mm : 1.20...1.60
2nd speed rpm : 350
travel mm : 2.40...3.00
3rd speed rpm : 650
travel mm : 4.40...5.00
4th speed rpm : 1045
travel mm : 8.40...8.60
5th speed rpm : 1170
travel mm : 10.10...10.50

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1050
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Aneroid pressure h: 900
Del.quantity : 236.0...238.0
1000 : (233.0...241.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 14.20  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 62...70

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.90  
Speed rpm : 225  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 380...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 15.20...15.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.30...12.70  
2nd pressure hPa : 535  
Rack travel in m: 14.60...14.70  
3rd pressure hPa : 290  
Rack travel in m: 13.10...13.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 226.0...234.0  
1000 s: (224.0...236.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 169.0...173.0  
1000 s: (167.0...175.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.20  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 5.30...5.50

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine: 15° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 9,0 L  
 Edition : 12.01.90  
 Replaces : 10.2.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 847  
 Injection pump  
 Pump designation : PE6P120A320RS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQV200...1100PA712-2  
 Governor no. : 0 421 813 636

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC9 02

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.90...13.00  
 Del.quantity cm<sup>3</sup>/ : 18.4...18.6  
 100 s: (18.1...18.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 225.0  
 Rack travel in mm : 4.9...5.3  
 Del.quantity cm<sup>3</sup>/ : 2.1...2.5  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 0.90...1.30  
 2nd speed rpm : 350  
 travel mm : 2.50...3.10  
 3rd speed rpm : 650  
 travel mm : 5.40...6.00  
 4th speed rpm : 1145  
 travel mm : 8.90...9.10  
 5th speed rpm : 1290  
 travel mm : 10.20...10.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1120  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 184.0...186.0  
 1000 : (181.0...189.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 300...360

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.90...13.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.90...11.30  
2nd pressure hPa : 345  
Rack travel in m: 12.40...12.50  
3rd pressure hPa : 175  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 179.0...187.0  
1000 s: (177.0...189.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 132.0...136.0  
1000 s: (130.0...138.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 14, 1989

Firing sequence of engine:  
1-5-3-6-2-4.

Start of delivery - engine: 15° before  
TDC

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 9,0 L 1  
 Edition : 12.02.90  
 Replaces : 10.2.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 848  
 Injection pump  
 Pump designation : PE6P120A32ORS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQV200...1100PA712-3  
 Governor no. : 0 421 813 637

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS9 05

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 4.40...4.50  
 : (4.35...5.55)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.20...12.30  
 Del. quantity cm<sup>3</sup>/ : 16.5...16.7  
 100 s : (16.2...17.0)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 4.9...5.3  
 Del. quantity cm<sup>3</sup>/ : 2.1...2.5  
 100 s : (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 0.90...1.30  
 2nd speed rpm : 350  
 travel mm : 2.50...3.10  
 3rd speed rpm : 650  
 travel mm : 5.40...6.00  
 4th speed rpm : 1145  
 travel mm : 8.90...9.10  
 5th speed rpm : 1280  
 travel mm : 10.10...10.50

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1120  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del. quantity : 165.0...167.0  
 1000 : (162.0...170.0)



Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1265...1295  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 300...360

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...11.00  
2nd pressure hPa : 360  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 240  
Rack travel in m: 11.00...11.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 160.0...168.0  
1000 s: (158.0...170.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1988-09-21

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 9,0 m  
 Edition : 12.02.90  
 Replaces : 17.2.89  
 Test oil : ISO-4113

Combination no. : 0 402 646 853

Injection pump  
 Pump designation : PE6P120A320RS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQ200/1100PA873  
 Governor no. : 0 421 801 415

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS9 05

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...5.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 5.1...5.7

Del.quantity cm<sup>3</sup>/ : 2.1...2.5

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

GUIDE SLEEVE POSITION

Control-Lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.5

Testing:

1st rack travel in: 11.20

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1300...1330

4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 320...360

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.20...12.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...11.00  
2nd pressure hPa : 360  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 240  
Rack travel in m: 11.00...11.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm3/ : 163.0...171.0  
1000 s: (161.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 125.0...129.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

#### APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 9,0 l 2  
 Edition : 12.02.90  
 Replaces : 2.6.89  
 Test oil : ISO-4113

Combination no. : 0 402 646 860

Injection pump  
 Pump designation : PE6P120A320RS7138  
 EP type number : 0 412 626 822  
 Governor  
 Governor design. : RQV350...1100PA795-1  
 Governor no. : 0 421 813 693

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS9 52,53,54,55

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 12.20...12.30

---

Del.quantity cm<sup>3</sup>/ : 16.5...16.7

---

100 s: (16.2...17.0)

---

Spread cm<sup>3</sup> : 0.6

---

100 s: (0.9)

---

2nd speed rpm : 350.0

Rack travel in mm : 4.7...5.3

Del.quantity cm<sup>3</sup>/ : 2.0...2.4

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.70

2nd speed rpm : 650  
 travel mm : 4.10...4.70

3rd speed rpm : 1145  
 travel mm : 7.80...8.00

4th speed rpm : 1255  
 travel mm : 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1230

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76

Testing:  
Speed rpm : 100  
Minimum rack travel: 10.30  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 370...430

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.

D09

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Oct. 17, 1988

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 j  
 Edition : 12.01.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 646 864

Injection pump  
 Pump designation : PE6P120A720RS70200  
 EP type number : 0 412 626 831  
 Governor  
 Governor design. : RQ200/1000PA713-7  
 Governor no. : 0 421 801 484

Customer-spec. information  
 Customer : SCANIA

Engine : DSC11 17

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 12.80...12.90

---

Del.quantity cm<sup>3</sup>/ : 20.1...20.3

---

100 s: (19.8...20.6)

---

Spread cm<sup>3</sup> : 0.6

---

100 s: (0.9)

---

2nd speed rpm : 225.0  
 Rack travel in mm : 4.5...4.9  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.00...1.40

2nd speed rpm : 350  
 travel mm : 2.70...3.30

3rd speed rpm : 650  
 travel mm : 3.70...4.30

4th speed rpm : 1060  
 travel mm : 4.20...4.40

5th speed rpm : 1205  
 travel mm : 6.10...6.50

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: 100

Speed rpm : 600  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 201.0...203.0  
 1000 : (198.0...206.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version

#### Setting point:

Speed rpm : 600  
Rack travel in mm : 16.5

#### Testing:

1st rack travel in: 11.80  
Speed rpm : 1045...1060  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 225  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 300...340

Aneroid/Altitude  
Compensator Test

1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.80...12.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.90  
2nd pressure hPa : 440  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 250  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 193.0...201.0  
1000 s: (191.0...203.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s: (148.0...156.0)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1045...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.50...4.70

#### Remarks:

:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 14, 1989

Start of delivery - engine: 17° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 i1  
 Edition : 01.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 865  
 Injection pump  
 Pump designation : FE6P120A72ORS7020  
 EP type number : 0 412 626 828  
 Governor  
 Governor design. : RQV200...1000PA539-8  
 Governor no. : 0 421 813 635

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS11 34

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.90...13.00  
 Del. quantity cm<sup>3</sup>/ : 20.8...21.0  
 100 s : (20.5...21.3)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 4.6...5.0  
 Del. quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s : (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60  
 2nd speed rpm : 350  
 travel mm : 2.40...3.00  
 3rd speed rpm : 650  
 travel mm : 4.50...5.10  
 4th speed rpm : 1045  
 travel mm : 8.40...8.60  
 5th speed rpm : 1150  
 travel mm : 9.80...10.20

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1050  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del. quantity : 208.0...210.0  
 1000 : (205.0...213.0)



Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 225  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 340...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.90...13.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.90  
2nd pressure hPa : 520  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 320  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 198.0...206.0  
1000 s: (196.0...208.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 151.0...155.0  
1000 s: (149.0...157.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.60...4.80

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 14, 1989

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 j1  
 Edition : 01.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 868  
 Injection pump  
 Pump designation : PE6P120A720RS7020  
 EP type number : 0 412 626 828  
 Governor  
 Governor design. : RQ200/1000PA713-5  
 Governor no. : 0 421 801 444

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS11 34

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.90...13.00  
 Del.quantity cm<sup>3</sup>/ : 20.8...21.0  
 100 s: (20.5...21.3)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 225.0  
 Rack travel in mm : 4.6...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 208.0...210.0  
 1000 : (205.0...213.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 16.5

Testing:  
 1st rack travel in: 11.90  
 Speed rpm : 1045...1060  
 2nd rack travel in: 4.00  
 Speed rpm : 1185...1215

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 225  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 305...345

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.90...13.00

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.90  
2nd pressure hPa : 520  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 320  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 198.0...206.0  
1000 s: (196.0...208.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 151.0...155.0  
1000 s: (149.0...157.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1045...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)

Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 14, 1989

Start of delivery - engine: 13° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 n  
 Edition : 12.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 870  
 Injection pump  
 Pump designation : PE6P120A72ORS7170  
 EP type number : 0 412 626 829  
 Governor  
 Governor design. : RQ750PA758-3  
 Governor no. : 0 421 801 467

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS 11

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test Lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.50...12.60  
 Del.quantity cm<sup>3</sup>/ : 24.9...25.1  
 100 s : (24.6...25.4)  
 Spread cm<sup>3</sup> : 0.6  
 100 s : (0.9)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 249.0...251.0  
 1000 : (246.0...254.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Testing:  
 1st rack travel in: 11.50  
 Speed rpm : 750...755  
 2nd rack travel in: 4.00  
 Speed rpm : 784...797  
 4th rack travel in: 850  
 Speed rpm : 0.00...1.00

BREAKAWAY

1st version  
 1mm rack travel less than  
 full load rack tr: 11.50  
 Speed rpm : 750...755

HIGH IDLE

1st version  
 Rack travel in mm : 5.80...6.00  
 Spread cm<sup>3</sup> : 4.00  
 1000 s : (7.00)

Remarks:

:

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

APPLICATION

Generator

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 m  
 Edition : 05.03.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 872  
 Injection pump  
 Pump designation : PE6P120A72ORS7126Z  
 EP type number : 0 412 626 830  
 Governor  
 Governor design. : RQV200...1000PA725-6  
 Governor no. : 0 421 813 755

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC11 08

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.80...12.90  
 Del.quantity cm<sup>3</sup>/ : 20.4...20.6  
 100 s: (20.1...20.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 4.7...5.1  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60  
 2nd speed rpm : 350  
 travel mm : 2.40...3.00  
 3rd speed rpm : 650  
 travel mm : 4.40...5.00  
 4th speed rpm : 1045  
 travel mm : 8.40...8.60  
 5th speed rpm : 1150  
 travel mm : 9.70...10.10

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1170  
 Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 204.0...206.0  
 1000 : (201.0...209.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 11.80  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 350...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.80...12.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 405  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 320  
Rack travel in m: 11.20...11.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 197.0...205.0  
1000 s: (195.0...207.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...155.0  
1000 s: (-)  
Rack travel in mm : 10.30...10.70

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 14, 1989

Start of delivery - engine: 9° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 L1  
 Edition : 12.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 873  
 Injection pump  
 Pump designation : PE6P120A72ORS7126  
 EP type number : 0 412 626 815  
 Governor  
 Governor design. : RQV350...1050PA795-3  
 Governor no. : 0 421 813 736

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS11 54,57

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

D20

Firing order : 1- 5- 3- 6- 2- 4  
 Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 14.10...14.20  
 Del.quantity cm<sup>3</sup>/ : 23.4...23.6  
 100 s: (23.1...23.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 4.3...4.7  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.20...1.60  
 2nd speed rpm : 650  
 travel mm : 4.10...4.70  
 3rd speed rpm : 1095  
 travel mm : 7.30...7.50  
 4th speed rpm : 1240  
 travel mm : 8.60...9.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1230  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 234.0...236.0  
 1000 : (231.0...239.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED



1st version  
Control lever  
position degrees: 98...106

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76

Testing:  
Speed rpm : 100  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 4.30...4.50  
Rack travel in mm : 2.00  
Speed rpm : 370...430

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 223.0...231.0  
1000 s: (221.0...233.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.30...4.50

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 o  
 Edition : 01.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 875  
 Injection pump  
 Pump designation : PE6P12DA72ORS7126Z  
 EP type number : 0 412 626 830  
 Governor  
 Governor design. : RQ200/1000PA745-1  
 Governor no. : 0 421 801 472

Customer-spec. information  
 Customer : SCANIA

Engine : DSC 11 08

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.80...12.90  
 Del.quantity cm<sup>3</sup>/ : 20.4...20.6  
 100 s: (20.1...20.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 225.0  
 Rack travel in mm : 4.7...5.1  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 204.0...206.0  
 1000 : (201.0...209.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version

Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 16.5

Testing:

1st rack travel in: 11.80  
 Speed rpm : 1045...1060  
 2nd rack travel in: 4.00  
 Speed rpm : 1180...1210

4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 310...350

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.80...12.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 470  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 320  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 197.0...205.0  
1000 s: (195.0...207.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1045...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 14, 1989

Start of delivery - engine: 9° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 i4  
 Edition : 16.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 878  
 Injection pump  
 Pump designation : PE6P120A720RS7020  
 EP type number : 0 412 626 828  
 Governor  
 Governor design. : RQV200...1000PA539-1  
 1  
 Governor no. : 0 421 813 813

Customer-spec. information  
 Customer : SCANIA

Engine : DS11 34

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.90...13.00  
 Del.quantity cm<sup>3</sup>/ : 20.8...21.0  
 100 s: (20.5...21.3)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 225.0  
 Rack travel in mm : 4.6...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.20...1.60  
 2nd speed rpm : 350  
 travel mm : 2.40...3.00  
 3rd speed rpm : 650  
 travel mm : 4.50...5.10  
 4th speed rpm : 1045  
 travel mm : 8.40...8.60  
 5th speed rpm : 1150  
 travel mm : 9.80...10.20

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1050  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 208.0...210.0  
 1000 : (205.0...213.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 225  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 340...400

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.90...13.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.90  
2nd pressure hPa : 520  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 320  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 198.0...206.0  
1000 s: (196.0...208.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 151.0...155.0  
1000 s: (149.0...157.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.60...4.80

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 16,0 c
Edition : 16.02.90
Replaces : 15.8.89
Test oil : ISO-4113
Combination no. : 0 402 646 883
Injection pump
Pump designation : PE6P130A720RS7122-2
EP type number : 0 412 636 813
Governor
Governor design. : RQV225...930PA922
Governor no. : 0 421 813 763

Customer-spec. information
Customer : VOLVO-TRUCK

Engine : TD162 FL,
1st version kW : 357.0
Rated speed : 1860

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70
: (3.55...3.75)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 28.8...29.1

100 s: (28.5...29.5)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 250.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 2.5...3.0
100 s: (2.3...3.3)

Spread cm3 : 0.5

100 s: (0.8)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 1.00...1.40

2nd speed rpm : 350
travel mm : 2.10...2.70

3rd speed rpm : 700
travel mm : 5.60...6.20

4th speed rpm : 975
travel mm : 8.20...8.40

5th speed rpm : 1090
travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1

Speed rpm : 1100

Rack travel in mm : 7.70...10.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 700

Del.quantity : 288.5...291.5  
1000 : (285.0...295.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 12.30  
Speed rpm : 970...980  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 60...68

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 225...450

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 13.30...13.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.90  
2nd pressure hPa : 80  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 610  
Rack travel in m: 12.90...13.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 182.0...185.0  
1000 s: (178.5...188.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 970...980

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (121.0...149.0)  
Rack travel in mm : 9.70...9.90

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.00...5.20  
Del.quantity cm<sup>3</sup>/ : 25.5...30.5  
1000 s: (23.0...33.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (8.00)

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 L  
 Edition : 12.01.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 885  
 Injection pump  
 Pump designation : PE6P120A720RS7126  
 EP type number : 0 412 626 815  
 Governor  
 Governor design. : RQV350...1050PA795-9  
 Governor no. : 0 421 813 769

Customer-spec. information  
 Customer : SCANIA

Engine : DS11 54,57

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 14.10...14.20  
 Del.quantity cm<sup>3</sup>/ : 23.4...23.6  
 100 s: (23.1...23.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 4.3...4.7  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.20...1.60  
 2nd speed rpm : 650  
 travel mm : 4.10...4.70  
 3rd speed rpm : 1095  
 travel mm : 7.30...7.50  
 4th speed rpm : 1240  
 travel mm : 8.60...9.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1230  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 234.0...236.0  
 1000 : (231.0...239.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)



## RATED SPEED

1st version  
Control lever  
position degrees: 98...106

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76

Testing:  
Speed rpm : 100  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 4.30...4.50  
Rack travel in mm : 2.00  
Speed rpm : 370...430

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.90  
2nd pressure hPa : 510  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 250  
Rack travel in m: 11.10...11.30

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 223.0...231.0  
1000 s: (221.0...233.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s: (148.0...156.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1090...1100

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

## LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.30...4.50

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

## ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 14, 1989

Start of delivery - engine: 16° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 n1  
 Edition : 23.03.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 886  
 Injection pump  
 Pump designation : PE6P120A72ORS7170  
 EP type number : 0 412 626 829  
 Governor  
 Governor design. : RQ750PA758-8  
 Governor no. : 0 421 801 491

Customer-spec. information  
 Customer : SCANIA

Engine : DS 11

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.50...12.60  
 Del.quantity cm3/ : 24.9...25.1  
 100 s: (24.6...25.4)  
 Spread cm3 : 0.7  
 100 s: (1.0)

2nd speed rpm : 500.0  
 Rack travel in mm : 9.7...10.1  
 Del.quantity cm3/ : 15.0...15.4  
 100 s: (14.8...15.6)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 249.0...251.0  
 1000 : (246.0...254.0)  
 Spread cm3 : 7.00  
 1000 : (10.00)

RATED SPEED

1st version  
 Testing:  
 1st rack travel in: 11.50  
 Speed rpm : 750...755  
 2nd rack travel in: 4.00  
 Speed rpm : 784...797  
 4th rack travel in: 850  
 Speed rpm : 0.00...1.00

Aneroid/Altitude  
 Compensator Test

1st version  
 Setting  
 Speed rpm : 500  
 Pressure hPa : 900  
 Rack travel mm : 12.50...12.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m : 9.70...10.10  
2nd pressure hPa : 575  
Rack travel in m : 12.00...12.10  
3rd pressure hPa : 370  
Rack travel in m : 10.70...11.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h : -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s : (148.0...156.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 750...755

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...130.0  
1000 s : (-)  
Rack travel in mm : 9.70...10.10

#### HIGH IDLE

1st version  
Aneroid pressure h: 900  
Rack travel in mm : 5.80...6.00  
Spread cm<sup>3</sup> : 4.00  
1000 s : (7.00)

Remarks:  
:

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1990-01-11

E03

Start of delivery - engine: 16° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

APPLICATION

Generator

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 j  
 Edition : 06.04.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 893  
 Injection pump  
 Pump designation : PE6P120A32ORS7202  
 EP type number : 0 412 626 835  
 Governor  
 Governor design. : RQ250/1000PA936  
 Governor no. : 0 421 801 507

Customer-spec. information

Customer : DAF  
 Engine : WS 268

1st version kW : 268.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.90...12.00

Del.quantity cm<sup>3</sup>/ : 21.7...21.9

100 s: (21.4...22.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.3

Del.quantity cm<sup>3</sup>/ : 2.3...2.9

100 s: (2.0...3.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 217.0...219.0

1000 : (214.0...222.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 10.90

Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20  
Rack travel in mm : 2.00  
Speed rpm : 310...350

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 1000  
Rack travel in m: 12.00...12.20

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.90...12.00

##### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 360  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 220  
Rack travel in m: 10.10...10.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 153.0...155.0  
1000 s: (150.0...158.0)

#### BREAKAWAY

#### 1st version

E05

1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.30  
Del.quantity cm<sup>3</sup>/ : 23.0...29.0  
1000 s: (20.0...32.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 k1  
 Edition : 12.04.90  
 Replaces : 5.1.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 894  
 Injection pump  
 Pump designation : PE6P120A320RS7194  
 EP type number : 0 412 626 834  
 Governor  
 Governor design. : RQ250/1000PA936-1  
 Governor no. : 0 421 801 508

Customer-spec. information  
 Customer : DAF

Engine : WS 295

1st version kW : 295.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 24.5...24.7

100 s: (24.2...25.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 245.0...247.0

1000 : (242.0...250.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 12.70

Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.7

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.20  
Speed rpm : 250  
Rack travel in mm : 6.60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 345...385

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1000  
Rack travel in m: 13.90...14.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 171.0...173.0  
1000 s: (168.0...176.0)

#### BREAKAWAY

#### 1st version

E07

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.60...6.80

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 j2  
 Edition : 06.07.90  
 Replaces : 12.1.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 895  
 Injection pump  
 Pump designation : PE6P120A32ORS7202  
 EP type number : 0 412 626 835  
 Governor  
 Governor design. : RQV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information  
 Customer : DAF

Engine : WS 268

1st version kW : 268.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850  


---

 Rack travel in mm : 11.90...12.00  


---

 Del.quantity cm<sup>3</sup>/ : 20.8...21.0  
 100 s : (20.5...21.3)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 4.9...5.3  
 Del.quantity cm<sup>3</sup>/ : 2.1...2.7  
 100 s : (1.8...3.0)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.70...1.10  
 2nd speed rpm : 400  
 travel mm : 2.40...3.20  
 3rd speed rpm : 800  
 travel mm : 5.20...5.60  
 4th speed rpm : 1000  
 travel mm : 7.30...7.50  
 5th speed rpm : 1300  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1060  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000



Del.quantity : 208.5...210.5  
1000 : (205.5...213.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 10.90  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1120...1150  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 74...82

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 250  
Rack travel in mm : 5.00...5.20

CONSTANT REGULATION  
Speed rpm : 270...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.90...12.00

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 360  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 220  
Rack travel in m: 10.10...10.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 145.5...147.5  
1000 s: (142.5...150.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 1030...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.30  
Del.quantity cm<sup>3</sup>/ : 21.0...27.0  
1000 s: (18.0...30.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 k4  
 Edition : 17.05.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 896  
 Injection pump  
 Pump designation : PE6P120A32ORS7194  
 EP type number : 0 412 626 834  
 Governor  
 Governor design. : RQV250...1000PA939  
 Governor no. : 0 421 813 829

Customer-spec. information  
 Customer : DAF

Engine : WS 295  
 1st version kW : 295.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.25)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850  


---

 Rack travel in mm : 13.70...13.80  


---

 Del.quantity cm<sup>3</sup>/ : 24.5...24.7  


---

 100 s: (24.2...25.0)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)  


---

2nd speed rpm : 250.0  
 Rack travel in mm : 7.6...8.0  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.70...1.10  
 2nd speed rpm : 400  
 travel mm : 2.40...3.20  
 3rd speed rpm : 800  
 travel mm : 5.20...5.60  
 4th speed rpm : 1000  
 travel mm : 7.30...7.50  
 5th speed rpm : 1300  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1060  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000

Del.quantity : 245.0...247.0  
1000 : (242.0...250.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 12.70  
Speed rpm : 1025...1040  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 250  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 275...385

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

1st version

E11

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 171.0...173.0  
1000 s: (168.0...176.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.70  
Speed rpm : 1025...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.60...6.80

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 k5  
Edition : 16.02.90  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 896  
Injection pump  
Pump designation : PE6P120A32ORS7194  
EP type number : 0 412 626 834  
Governor  
Governor design. : RQV250...1000PA939-1  
Governor no. : 0 421 813 830

Customer-spec. information  
Customer : DAF

Engine : WS 295

1st version kW : 295.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.25)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del. quantity cm<sup>3</sup>/ : 24.5...24.7

100 s : (24.2...25.0)

Spread cm<sup>3</sup> : 0.5

100 s : (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s : (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s : (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.70...1.10

2nd speed rpm : 400  
travel mm : 2.40...3.20

3rd speed rpm : 800  
travel mm : 5.20...5.60

4th speed rpm : 1000  
travel mm : 7.30...7.50

5th speed rpm : 1300  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1060

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 245.0...247.0  
1000 : (242.0...250.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 12.70  
Speed rpm : 1025...1040  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.20  
Speed rpm : 250  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 275...385

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

START CUT-OUT

Speed 1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 171.0...173.0  
1000 s: (168.0...176.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.70  
Speed rpm : 1025...1040

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.60...6.80

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 k3  
 Edition : 02.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 896  
 Injection pump  
 Pump designation : PE6P120A32ORS7194  
 EP type number : 0 412 626 834  
 Governor  
 Governor design. : RQV275...1000PA939-1  
 Governor no. : 0 421 813 830

Customer-spec. information  
 Customer : DAF

Engine : WS 295

1st version kW : 295.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.25)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del. quantity cm<sup>3</sup>/ : 24.5...24.7

100 s: (24.2...25.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.70...1.10

2nd speed rpm : 400  
 travel mm : 2.40...3.20

3rd speed rpm : 800  
 travel mm : 5.20...5.60

4th speed rpm : 1000  
 travel mm : 7.30...7.50

5th speed rpm : 1300  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1060  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000

Del.quantity : 245.0...247.0  
1000 : (242.0...250.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 12.70  
Speed rpm : 1025...1040  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 250  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 275...385

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 460  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 310  
Rack travel in m: 12.00...12.20

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

1st version

E15

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 171.0...173.0  
1000 s: (168.0...176.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.70  
Speed rpm : 1025...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.60...6.80

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t 5  
 Edition : 23.03.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 901  
 Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQV300..950PA797-12  
 Governor no. : 0 421 813 840

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 249.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.50...13.70

Del.quantity cm<sup>3</sup>/ : 20.7...20.9

100 s: (20.4...21.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.40

2nd speed rpm : 620

travel mm : 5.00...5.40

3rd speed rpm : 780

travel mm : 6.00...6.50

4th speed rpm : 1010

travel mm : 8.30...8.80

5th speed rpm : 1100

travel mm : 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



1st version  
Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 207.0...209.0  
1000 : (204.0...212.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 13.60  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00

CONSTANT REGULATION  
Speed rpm : 300...500

TORQUE CONTROL  
Rack travel in m: 14.60...14.80  
Rack travel in m: 14.60...14.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 550  
Rack travel in m: 12.70...13.00  
3rd pressure hPa : 1150  
Rack travel in m: 13.80...14.00  
4th pressure hPa : 1250  
Rack travel in m: 14.30...14.50

5th pressure hPa : -  
Rack travel in m: 8.90...9.20

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 238.0...240.0  
1000 s: (235.0...243.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 236.0...239.0  
1000 s: (233.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 138.0...140.0  
1000 s: (135.0...143.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 205.0...225.0  
1000 s: (201.0...229.0)

Remarks: :

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 13,8 w  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 902  
 Injection pump  
 Pump designation : PE6P130A72ORS7197  
 EP type number : 0 412 636 815  
 Governor  
 Governor design. : RQV300...900PA946  
 Governor no. : 0 421 813 845

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8210.42.151

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 13.50...13.60  
 Del.quantity cm<sup>3</sup>/ : 25.5...25.8  
 100 s: (25.1...26.1)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.1...5.5  
 Del.quantity cm<sup>3</sup>/ : 1.9...2.5  
 100 s: (1.5...2.9)  
 Spread cm<sup>3</sup> : 1.0  
 100 s: (1.4)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.40  
 3rd speed rpm : 700  
 travel mm : 5.50...5.90  
 4th speed rpm : 900  
 travel mm : 7.70...7.90  
 5th speed rpm : 1200  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 935  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 900  
 Del.quantity : 255.0...258.0  
 1000 : (251.5...261.5)

Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 12.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1020...1050  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 76...84

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.80  
Speed rpm : 300  
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION  
Speed rpm : 320...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.40...13.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.70  
2nd pressure hPa : 345  
Rack travel in m: 12.70...12.80  
3rd pressure hPa : 275  
Rack travel in m: 11.10...11.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 181.0...184.0  
1000 s: (177.5...187.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 940...950

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.10...5.50  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm3 : 10.00  
1000 s: (14.00)

#### Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 b2
Edition : 30.03.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 646 905
Injection pump
Pump designation : PE6P120A72ORS7126
EP type number : 0 412 626 815
Governor
Governor design. : RQV200...1000PA725-6
Governor no. : 0 421 813 755

Customer-spec. information
Customer : SCANIA

Engine : DSC11 10

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 019
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test lines : 1 680 750 015
Outside diameter x Wall thickness x Length mm : 6.00X1.50X600
(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 5.00...5.10
: (4.95...5.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
Rack travel in mm : 13.90...14.00
Del.quantity cm3/ : 23.2...23.4
100 s: (22.9...23.7)
Spread cm3 : 0.6
100 s: (0.9)
2nd speed rpm : 225.0
Rack travel in mm : 4.7...5.1
Del.quantity cm3/ : 1.8...2.2
100 s: (-)
Spread cm3 : 0.3
100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225
travel mm : 1.20...1.60
2nd speed rpm : 350
travel mm : 2.40...3.00
3rd speed rpm : 650
travel mm : 4.40...5.00
4th speed rpm : 1045
travel mm : 8.40...8.60
5th speed rpm : 1150
travel mm : 9.70...10.10

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1170
Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Aneroid pressure h: 900
Del.quantity : 232.0...234.0
1000 : (229.0...237.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

#### Testing:

1st rack travel in: 12.90  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 61...69

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 350...410

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.90...14.00

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 555  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 320  
Rack travel in m: 11.20...11.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 219.0...227.0  
1000 s: (217.0...229.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...155.0  
1000 s: (-)  
Rack travel in mm : 10.30...10.70

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 y  
 Edition : 19.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 906  
 Injection pump  
 Pump designation : PE6P120A320LS7832  
 EP type number : 0 412 626 836  
 Governor  
 Governor design. : RQ300/1050PA952  
 Governor no. : 0 421 801 521

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 228.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.80...15.00

Del.quantity cm<sup>3</sup>/ : 22.0...22.2

100 s: (21.7...22.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...7.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-le /er position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 220.0...222.0

1000 : (217.0...225.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.70  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.7

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.70  
Speed rpm : 300  
Rack travel in mm : 6.40...7.00  
Rack travel in mm : 2.00  
Speed rpm : 390...430

#### TORQUE CONTROL

Dimension a mm : 0.35  
2nd speed rpm : 1050  
Rack travel in m: 14.70...14.90  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.80...15.00

#### Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 550  
Rack travel in m: 13.50...13.70  
3rd pressure hPa : 1400  
Rack travel in m: 14.90...15.00 \*  
4th pressure hPa : -  
Rack travel in m: 9.70...10.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1600

Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 221.0...224.0  
1000 s: (218.0...227.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 235.0...239.0  
1000 s: (232.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 129.0...131.0  
1000 s: (126.0...134.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.70  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

#### Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t 6  
 Edition : 19.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 907  
 Injection pump  
 Pump designation : PE6P120A320LS7808-2  
 EP type number : 0 412 626 833  
 Governor  
 Governor design. : RQV350..950PA870-8  
 Governor no. : 0 421 813 861

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 242.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 13.80...14.00  
 Del.quantity cm<sup>3</sup>/ : 21.4...21.6  
 100 s: (21.1...21.9)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.2...5.5  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.70  
 2nd speed rpm : 425  
 travel mm : 2.20...2.70  
 3rd speed rpm : 700  
 travel mm : 4.10...4.60  
 4th speed rpm : 1010  
 travel mm : 7.80...8.30  
 5th speed rpm : 1200  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1040  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



1st version  
Speed rpm : 600  
Aneroid pressure h: 800  
Del.quantity : 214.0...216.0  
1000 : (211.0...219.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 13.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1085...1115  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 200  
Minimum rack trave: 7.70  
Speed rpm : 350  
Rack travel in mm : 5.20...5.50

CONSTANT REGULATION  
Speed rpm : 350...500

TORQUE CONTROL  
Dimension a mm : -  
2nd speed rpm : 950  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.80...14.00

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 550  
Rack travel in m: 12.90...13.10  
3rd pressure hPa : 1050

Rack travel in m: 14.10...14.30  
4th pressure hPa : 1150  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 9.20...9.50

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 245.0...247.0  
1000 s: (242.0...250.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 244.0...248.0  
1000 s: (241.0...251.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 11.0 t 7  
 Edition : 06.04.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 646 908

Injection pump  
 Pump designation : PE6P120A320LS7808  
 EP type number : 0 412 626 816  
 Governor  
 Governor design. : RQ300/950PA932-3  
 Governor no. : 0 421 801 528

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 249.0  
 Rated speed : 1900

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
 -360  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

### BASIC SETTING

1st speed rpm : 600  


---

 Rack travel in mm : 13.50...13.70  


---

 Del. quantity cm<sup>3</sup>/ : 20.7...20.9  
 100 s: (20.4...21.2)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  


---

2nd speed rpm : 300.0  
 Rack travel in mm : 5.7...6.0  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

### GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 900  
 Del. quantity : 207.0...209.0  
 1000 : (204.0...212.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

### RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.60  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

Testing:

Speed rpm : 200  
Minimum rack trave: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.70...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.30  
2nd speed rpm : 950  
Rack travel in m: 14.60...14.80  
3rd speed rpm : 700  
Rack travel in m: 14.60...14.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 550  
Rack travel in m: 12.70...12.90  
3rd pressure hPa : 1150  
Rack travel in m: 13.80...14.00  
4th pressure hPa : 1250  
Rack travel in m: 14.30...14.50  
5th pressure hPa : -  
Rack travel in m: 8.90...9.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1350  
Speed rpm : 950  
Del.quantity cm3/ : 238.0...240.0  
1000 s: (235.0...243.0)  
Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1350  
Speed rpm : 800  
Del.quantity cm3/ : 236.0...239.0  
1000 s: (233.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm3/ : 138.0...140.0  
1000 s: (135.0...143.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (201.0...229.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 L  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 912  
 Injection pump  
 Pump designation : PE6P120A32ORS7218  
 EP type number : 0 412 626 839  
 Governor  
 Governor design. : RQ250/1000PA936-1  
 Governor no. : 0 421 801 508

Customer-spec. information  
 Customer : DAF

Engine : WS 268

1st version kW : 268.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
 : (5.25...5.45)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 15.00...15.10

Del. quantity cm<sup>3</sup>/ : 23.7...23.9

100 s: (23.4...24.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.4...6.8

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del. quantity : 237.0...239.0

1000 : (234.0...242.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:  
Speed rpm : 550  
Rack travel in mm : 15.8

Testing:  
1st rack travel in: 14.00  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 1000  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.00...15.10

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 480  
Rack travel in m: 14.20...14.30  
3rd pressure hPa : 330  
Rack travel in m: 13.20...13.40

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm3/ : 166.0...170.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.00  
Speed rpm : 1035...1050

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 L1
Edition : 06.07.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 646 913
Injection pump
Pump designation : PE6P120A32ORS7218
EP type number : 0 412 626 839
Governor
Governor design. : RQV250...1000PA939
Governor no. : 0 421 813 829

Customer-spec. information
Customer : DAF

Engine : WS 268
1st version kW : 268.0
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder
assembly : 1 688 901 019
Opening
pressure, bar : 207...210
Orifice plate
diameter mm : 0,8
Test lines : 1 680 750 075
Outside diameter
x Wall thickness
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40
: (5.25...5.45)
Rack travel in mm : 14.50...15.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10
& maximum rack tra: 14.5...15.5
Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850
Rack travel in mm : 15.00...15.10
Del.quantity cm3/ : 23.7...23.9
100 s: (23.4...24.2)
Spread cm3 : 0.5
100 s: (0.9)
2nd speed rpm : 250.0
Rack travel in mm : 6.4...6.8
Del.quantity cm3/ : 1.4...2.0
100 s: (1.1...2.3)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045
travel mm : 7.80...8.00
2nd speed rpm : 250
travel mm : 0.70...1.10
3rd speed rpm : 400
travel mm : 2.50...3.10
4th speed rpm : 700
travel mm : 4.50...4.90
5th speed rpm : 1350
travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1075
Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850  
Aneroid pressure h: 1000  
Del.quantity : 237.0...239.0  
1000 : (234.0...242.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 51...59

Testing:

1st rack travel in: 14.00  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever  
position degrees: 12...20

Testing:

Speed rpm : 100  
Minimum rack trave: 7.00  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 270...380

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 12.40...12.60

2nd pressure hPa : 480

Rack travel in m: 14.20...14.30

3rd pressure hPa : 330

Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 166.0...170.0  
1000 s: (164.0...172.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.00

Speed rpm : 1040...1050

LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.90...5.10

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 a 1  
 Edition : 15.03.90  
 Replaces : 24.2.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 812

Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQ300/1050PA717  
 Governor no. : 0 421 801 258

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kW : 320.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5- 4-  
 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

---

Rack travel in mm : 14.70...14.90

---

Del. quantity cm<sup>3</sup>/ : 22.0...22.2  
 100 s: (21.7...22.5)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.1...6.7  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEFVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 680  
 Del. quantity : 220.0...222.0  
 1000 : (217.0...225.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600



Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.40  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.10...6.70  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.90  
2nd speed rpm : 1050  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 850  
Rack travel in m: 15.80...16.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 680  
Rack travel mm : 14.70...14.90

Measurement

Speed 1/min : 600

1st pressure hPa : 310  
Rack travel in m: 12.10...12.30  
2nd pressure hPa : 470  
Rack travel in m: 13.70...13.90  
3rd pressure hPa : 820  
Rack travel in m: 14.90...15.00  
4th pressure hPa : 950  
Rack travel in m: 15.60...15.90  
5th pressure hPa : -  
Rack travel in m: 11.40...11.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1150  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 229.0...232.0  
1000 s: (226.0...235.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1150  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 247.0...251.0  
1000 s: (244.0...254.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 14.40  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 a 4  
 Edition : 23.04.90  
 Replaces : 3.11.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 817

Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQ300/1050PA762-5  
 Governor no. : 0 421 801 399

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.00...14.20

Del.quantity cm<sup>3</sup>/ : 20.4...20.6

100 s: (20.1...20.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm<sup>3</sup>/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.8)

GUIDE SLEF/E POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 650

Del.quantity : 204.0...206.0

1000 : (201.0...209.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.70  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.75  
2nd speed rpm : 1050  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 850  
Rack travel in m: 13.70...14.00  
4th speed rpm : 700  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.00...14.20

Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 400  
Rack travel in m: 13.30...13.60  
3rd pressure hPa : 850  
Rack travel in m: 14.10...14.20 \*  
4th pressure hPa : -  
Rack travel in m: 11.40...11.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm3/ : 178.0...181.0  
1000 s: (175.0...184.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: 1050  
Speed rpm : 700  
Del.quantity cm3/ : 213.0...217.0  
1000 s: (210.0...220.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: 1050  
Speed rpm : 850  
Del.quantity cm3/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 7.00  
1000 s: (10.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a 5  
Edition : 17.05.90  
Replaces : 3.11.89  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 825  
  
Injection pump  
Pump designation : PE8P120A320LS7801  
EP type number : 0 412 628 806  
Governor  
Governor design. : RQV300..1050PA797-3  
Governor no. : 0 421 813 627

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 260.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                  : (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.00...14.20

Del. quantity cm<sup>3</sup>/ : 20.4...20.6

100 s : (20.1...20.9)

Spread cm<sup>3</sup> : 0.4

100 s : (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del. quantity cm<sup>3</sup>/ : 1.3...1.9

100 s : (1.0...2.2)

Spread cm<sup>3</sup> : 0.5

100 s : (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.20...1.40

2nd speed rpm : 600  
travel mm : 4.90...5.10

3rd speed rpm : 1075  
travel mm : 7.40...7.60

4th speed rpm : 1100  
travel mm : 8.00...8.20

5th speed rpm : 1150  
travel mm : 9.00...9.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 500  
Aneroid pressure h: 650  
Del.quantity : 204.0...206.0  
1000 : (201.0...209.0)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 1.40  
2nd speed rpm : 1050  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 850  
Rack travel in m: 13.70...14.00  
4th speed rpm : 700  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.00...14.20

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.30...12.50

F09

2nd pressure hPa : 400  
Rack travel in m: 13.30...13.60  
3rd pressure hPa : 850  
Rack travel in m: 14.10...14.20 \*  
4th pressure hPa : -  
Rack travel in m: 11.40...11.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 178.0...181.0  
1000 s: (175.0...184.0)  
Spread cm<sup>3</sup> : 7.00  
1000 s: (10.0)  
Aneroid pressure h: 1050  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 213.0...217.0  
1000 s: (210.0...220.0)  
Spread cm<sup>3</sup> : 7.00  
1000 s: (10.0)  
Aneroid pressure h: 1050  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Spread cm<sup>3</sup> : 7.00  
1000 s: (10.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm<sup>3</sup> : 7.00  
1000 s: (10.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

\* Increase in control-rod travel with

respect to setting at least 0.1 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 e  
 Edition : 17.05.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 831  
 Injection pump  
 Pump designation : PE8P120A320LS7801-1  
 EP type number : 0 412 628 818  
 Governor  
 Governor design. : RQV350..1050PA842-3  
 Governor no. : 0 421 813 622

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kW : 320.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.50...14.70

Del. quantity cm<sup>3</sup>/ : 21.2...21.4

100 s: (20.9...21.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.7...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 0.80...1.20

2nd speed rpm : 510  
 travel mm : 3.60...4.10

3rd speed rpm : 1100  
 travel mm : 7.80...8.40

4th speed rpm : 1270  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1185

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure hPa : 750  
Del.quantity : 212.0...214.0  
1000 : (209.0...217.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

#### Testing:

1st rack travel in: 14.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Control lever  
position degrees: 10...18

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.40  
Speed rpm : 350  
Rack travel in mm : 5.50...6.10

#### CONSTANT REGULATION

Speed rpm : 350...550

#### TORQUE CONTROL

2nd speed rpm : 1050  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 975  
Rack travel in m: 15.40...15.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 750  
Rack travel mm : 14.50...14.70

#### Measurement

Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 550  
Rack travel in m: 13.60...13.80  
3rd pressure hPa : 900  
Rack travel in m: 14.70...14.80  
4th pressure hPa : 1250

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Rack travel in m: 15.50...15.70  
5th pressure hPa : -  
Rack travel in m: 11.40...11.70

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1250  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 227.0...230.0  
1000 s: (224.0...233.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1250  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 238.0...242.0  
1000 s: (235.0...245.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1250  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 156.0...159.0  
1000 s: (153.0...162.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 150.0...152.0  
1000 s: (147.0...155.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 14,7 e 2  
 Edition : 08.06.90  
 Replaces : -  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 648 831  
  
 Injection pump  
 Pump designation : PE8P120A320LS7801-1  
 EP type number : 0 412 628 818  
 Governor  
 Governor design. : RQV350..1050PA842-7  
 Governor no. : 0 421 813 874

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kw : 320.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 : 4- 1

Phasing : 0-45-90-135-180-225-  
 : 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.50...14.70

Del. quantity cm<sup>3</sup>/ : 21.2...21.4

100 s: (20.9...21.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.7...5.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 0.80...1.20

2nd speed rpm : 510  
travel mm : 3.60...4.10

3rd speed rpm : 1100  
travel mm : 7.80...8.40

4th speed rpm : 1270  
travel mm : 11.00...12.00

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1185

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 750  
Del.quantity : 212.0...214.0  
1000 : (209.0...217.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

#### Testing:

1st rack travel in: 14.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Control lever  
position degrees: 10...18

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.40  
Speed rpm : 350  
Rack travel in mm : 5.50...6.10

#### CONSTANT REGULATION

Speed rpm : 350...550

#### TORQUE CONTROL

Dimension a mm : 0.20  
2nd speed rpm : 1050  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 975  
Rack travel in m: 15.40...15.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 750  
Rack travel mm : 14.50...14.70

#### Measurement

Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 550  
Rack travel in m: 13.60...13.80  
3rd pressure hPa : 900  
Rack travel in m: 14.70...14.80

4th pressure hPa : 1250  
Rack travel in m: 15.50...15.70  
5th pressure hPa : -  
Rack travel in m: 11.40...11.70

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1250  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 227.0...230.0  
1000 s: (224.0...233.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1250  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 238.0...242.0  
1000 s: (235.0...245.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Aneroid pressure h: 1250  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 156.0...159.0  
1000 s: (153.0...162.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 150.0...152.0  
1000 s: (147.0...155.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 14.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 14,7 a10  
 Edition : 30.03.90  
 Replaces : 1.9.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 833

Injection pump  
 Pump designation : PE8P120A320LS7801-1  
 EP type number : 0 412 628 818  
 Governor  
 Governor design. : RQV350..1050PA866-3  
 Governor no. : 0 421 813 703

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...6.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.20...1.40

2nd speed rpm : 600

travel mm : 4.90...5.10

3rd speed rpm : 1100

travel mm : 8.00...8.50

4th speed rpm : 1170

travel mm : 9.20...9.80

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1090

Rack travel in mm : 16.50...18.00

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050  
Aneroid pressure h : 1100  
Del.quantity : 181.0...183.0  
1000 : (178.0...186.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 11.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Control lever  
position degrees: 67...75

#### Testing:

Speed rpm : 250  
Minimum rack travel: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

#### CONSTANT REGULATION

Speed rpm : 350...550

#### TORQUE CONTROL

Dimension a mm : 1.60  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 750  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 950  
Rack travel in m: 13.50...13.60  
4th speed rpm : 830  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 11.20...11.50

#### Measurement

Speed 1/min : 600

1st pressure hPa : 420

Rack travel in m: 11.90...12.10  
2nd pressure hPa : 600  
Rack travel in m: 13.60...13.80

#### START CUT-OUT

Speed 1/min : 270 (250)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1100  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 213.0...217.0  
1000 s: (210.0...220.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 152.0...154.0 \*  
1000 s: (149.0...157.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 143.0...145.0  
1000 s: (140.0...148.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 11.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (176.0...204.0)

Remarks:

:

\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a 8  
 Edition : 01.02.90  
 Replaces : 7.7.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 841

Injection pump  
 Pump designation : PE8P120A320LS7801-1  
 EP type number : 0 412 628 818  
 Governor  
 Governor design. : RQ300/1050PA762-5  
 Governor no. : 0 421 801 399

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.10...14.30

Del.quantity cm<sup>3</sup>/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEV/E POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 650

Del.quantity : 203.0...205.0

1000 : (200.0...208.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.75  
2nd speed rpm : 1050  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 850  
Rack travel in m: 13.70...14.00  
4th speed rpm : 700  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 400  
Rack travel in m: 13.40...13.70  
3rd pressure hPa : 850  
Rack travel in m: 14.20...14.30 \*

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

F18

Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm3/ : 180.0...183.0  
1000 s: (177.0...186.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 700  
Del.quantity cm3/ : 215.0...219.0  
1000 s: (212.0...222.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 850  
Del.quantity cm3/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 j  
 Edition : 06.07.90  
 Replaces : 2.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 844

Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQ300/1050PA717-2  
 Governor no. : 0 421 801 439

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

---

Rack travel in mm : 13.60...13.80

---

Del.quantity cm<sup>3</sup>/ : 23.6...23.9  
 100 s: (23.3...24.2)

---

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.5  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.8)

GUIDE SLEFVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 900  
 Del.quantity : 236.0...239.0  
 1000 : (233.0...242.0)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 850  
Rack travel in m: 15.00...15.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 600  
1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050  
Rack travel in m: 13.70...13.90  
4th pressure hPa : 1350  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 248.0...252.0  
1000 s: (245.0...255.0)  
Spread cm3 : 7.00  
1000 s: (10.)  
Aneroid pressure h: 1600  
Speed rpm : 850  
Del.quantity cm3/ : 265.0...269.0  
1000 s: (262.0...272.0)  
Spread cm3 : 7.00  
1000 s: (10.00)  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 7.00  
1000 s: (10.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 k  
 Edition : 06.07.90  
 Replaces : 6.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 845

Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQV300..1050PA797-5  
 Governor no. : 0 421 813 702

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM442 LA

1st version kW : 353.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 23.6...23.9  
 100 s: (23.3...24.2)

Spread cm<sup>3</sup> : 0.4  
 100 s: (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.5  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.8)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.40  
 2nd speed rpm : 800  
 travel mm : 5.80...6.10  
 3rd speed rpm : 1120  
 travel mm : 8.20...8.80  
 4th speed rpm : 1180  
 travel mm : 9.60...10.40

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 236.0...239.0  
1000 : (233.0...242.0)  
Spread cm3 : 4.00  
1000 : (7.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 13.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 82...90

#### Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50

#### CONSTANT REGULATION

Speed rpm : 300...500

#### TORQUE CONTROL

Dimension a mm : 1.30  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050  
Rack travel in m: 13.70...13.90 \*

4th pressure hPa : 1350  
Rack travel in m: 14.50...14.70  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 248.0...252.0  
1000 s: (245.0...255.0)  
Spread cm3 : 7.00  
1000 s: (10.)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 265.0...269.0  
1000 s: (262.0...272.0)  
Spread cm3 : 7.00  
1000 s: (10.00)  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 7.00  
1000 s: (10.00)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,2 n  
 Edition : 05.03.90  
 Replaces : 29.3.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 852

Injection pump  
 Pump designation : PE8P120A920/4LS7166  
 EP type number : 0 412 628 832  
 Governor  
 Governor design. : RQ750PA758-2  
 Governor no. : 0 421 801 462

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS 14

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 12.50...12.60

---

Del. quantity cm<sup>3</sup>/ : 25.2...25.4

---

100 s: (24.9...25.7)

---

Spread cm<sup>3</sup> : 0.7

---

100 s: (1.0)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del. quantity : 252.0...254.0  
 1000 : (249.0...257.0)

Spread cm<sup>3</sup> : 7.00  
 1000 : (10.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 88...96

Testing:  
 1st rack travel in: 11.50  
 Speed rpm : 750...755  
 2nd rack travel in: 4.00  
 Speed rpm : 784...797  
 4th rack travel in: 850  
 Speed rpm : 0.00...1.00

BREAKAWAY

1st version  
 1mm rack travel less than  
 full load rack tr: 11.50  
 Speed rpm : 750...755

HIGH IDLE

1st version

Rack travel in mm : 5.00...5.20  
Spread cm<sup>3</sup> : 4.00  
1000 s: (7.00)

Remarks:

:

Start-of-delivery setting with ROBO  
diaphragm.

APPLICATION

Generator

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,0 h3  
 Edition : 12.02.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 853

Injection pump  
 Pump designation : PE8P120A920/4LS7125  
 EP type number : 0 412 628 833  
 Governor  
 Governor design. : RQV350...1050PA795-2  
 Governor no. : 0 421 813 721

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS 14

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 13.50...13.60

---

Del.quantity cm<sup>3</sup>/ : 21.4...21.6  
 100 s: (21.1...21.9)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.6...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

2nd speed rpm : 350  
 travel mm : 1.30...1.70  
 3rd speed rpm : 650  
 travel mm : 4.10...4.70  
 4th speed rpm : 1095  
 travel mm : 7.80...8.00  
 5th speed rpm : 1215  
 travel mm : 9.10...9.50

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1170  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 214.0...216.0  
 1000 : (211.0...219.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 100...108

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 69...77

Testing:  
Speed rpm : 100  
Minimum rack trave: 10.50  
Speed rpm : 350  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 370...430

FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 950  
Del.quantity cm3/ : 203.0...211.0  
1000 s: (201.0...213.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...290.0  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.60...4.80

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 17,2 e  
 Edition : 08.06.90  
 Replaces : 13.12.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 854

Injection pump  
 Pump designation : PE8P130A920/5LS7822  
 EP type number : 0 412 638 802  
 Governor  
 Governor design. : RQV300...950PA905  
 Governor no. : 0 421 813 723

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8280.42.001

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 40...45

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 105

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 688 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
 : (5.05...5.25)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 4- 3- 6- 5-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 550

---

Rack travel in mm : 11.60...11.70

---

Del.quantity cm<sup>3</sup>/ : 23.5...23.8

---

100 s: (23.1...24.1)

---

Spread cm<sup>3</sup> : 0.8

---

100 s: (1.2)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 6.1...6.5  
 Del.quantity cm<sup>3</sup>/ : 2.0...2.6  
 100 s: (1.6...3.0)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 0.60...1.10  
 2nd speed rpm : 350  
 travel mm : 2.10...2.50  
 3rd speed rpm : 600  
 travel mm : 3.80...4.40  
 4th speed rpm : 950  
 travel mm : 7.20...7.40  
 5th speed rpm : 1200  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1020  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 550  
 Aneroid pressure h: 900  
 Del.quantity : 235.0...238.0  
 1000 : (231.5...241.5)

Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 109...117

Testing:  
1st rack travel in: 10.60  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION  
Speed rpm : 380...480

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.60...11.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.50...9.80  
2nd pressure hPa : 440  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 400  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 215.0...222.0  
1000 s: (211.5...225.5)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 173.0...176.0  
1000 s: (169.5...179.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...240.0  
1000 s: (206.0...244.0)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 o
Edition : 12.02.90
Replaces : 13.12.89
Test oil : ISO-4113
Combination no. : 0 402 648 855
Injection pump
Pump designation : PE8P120A320LS7823
EP type number : 0 412 628 835
Governor
Governor design. : RQV350..1050PA870-5
Governor no. : 0 421 813 735

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kw : 353.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
: (5.15...5.35)
Rack travel in mm : 20.00...21.00
Firing order : 8- 7- 2- 6- 3- 5-
4- 1

Phasing : 0-45-90-135-180-225-
270-315
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600
Rack travel in mm : 13.60...13.80
Del.quantity cm3/ : 23.4...23.7
100 s: (23.1...24.0)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 350.0
Rack travel in mm : 5.0...5.6
Del.quantity cm3/ : 1.6...2.2
100 s: (1.3...2.5)
Spread cm3 : 0.6
100 s: (1.0)

(B) Setting of injection pump
with governor

GUIDE SLEEF/E TRAVEL
1st speed rpm : 350
travel mm : 1.40...1.60
2nd speed rpm : 800
travel mm : 4.70...5.10
3rd speed rpm : 1100
travel mm : 7.60...8.20
4th speed rpm : 1175
travel mm : 9.20...9.80

GUIDE SLEEVE POSITION
Control-lever position
Degree: -1
Speed rpm : 1150
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 600
Aneroid pressure h: 900

Del.quantity : 234.0...237.0  
1000 : (231.0...240.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 62...70

Testing:  
Speed rpm : 250  
Minimum rack travel: 7.10  
Speed rpm : 350  
Rack travel in mm : 5.00...5.60

CONSTANT REGULATION  
Speed rpm : 350...550

TORQUE CONTROL  
Dimension a mm : 0.50  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 15.30...15.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 500  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050  
Rack travel in m: 13.70...13.90 \*  
4th pressure hPa : 1250  
Rack travel in m: 14.50...14.70

5th pressure hPa : -  
Rack travel in m: 10.10...10.40

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 252.0...256.0  
1000 s: (249.0...259.0)  
Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 184.0...187.0  
1000 s: (181.0...190.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,2 m
Edition : 12.02.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 648 863
Injection pump
Pump designation : PE8P120A920/4LS7180
EP type number : 0 412 628 837
Governor
Governor design. : RQV350...1050PA795-6
Governor no. : 0 421 813 754

Customer-spec. information
Customer : SCANIA

Engine : DSI 14

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 019
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
: (4.95...5.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-
6- 8

Phasing : 0-45-90-135-180-225-
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
Rack travel in mm : 13.20...13.30
Del.quantity cm3/ : 26.8...27.0
100 s: (26.5...27.3)
Spread cm3 : 0.7
100 s: (1.0)

2nd speed rpm : 350.0
Rack travel in mm : 4.5...4.9
Del.quantity cm3/ : 1.5...1.9
100 s: (-)
Spread cm3 : 0.3
100 s: (0.6)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

2nd speed rpm : 350
travel mm : 1.30...1.70
3rd speed rpm : 650
travel mm : 4.10...4.70
4th speed rpm : 1145
travel mm : 7.80...8.00
5th speed rpm : 1255
travel mm : 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1230
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Del.quantity : 268.0...270.0
1000 : (265.0...273.0)
Spread cm3 : 7.00
1000 : (10.00)

RATED SPEED

1st version  
Control lever  
position degrees: 98...106

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76

Testing:  
Speed rpm : 100  
Minimum rack trave: 10.30  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 370...430

FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1050  
Del.quantity cm3/ : 258.0...266.0  
1000 s: (256.0...268.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1090...1100

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.50...4.70

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 14,7 g  
 Edition : 19.06.90  
 Replaces : 24.11.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 864

Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQ300/950PA762-7  
 Governor no. : 0 421 801 480

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0  
 Rated speed : 1900

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm<sup>3</sup>/ : 25.4...25.6

100 s: (25.1...25.9)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

### GUIDE SLEFVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 254.0...256.0

1000 : (251.0...259.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

### RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.20  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.90  
2nd speed rpm : 950  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 800  
Rack travel in m: 15.50...15.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600  
1st pressure hPa : 350  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 700  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1200  
Rack travel in m: 14.80...15.00  
4th pressure hPa : 1500  
Rack travel in m: 15.40...15.60  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 950  
Del.quantity cm3/ : 270.0...273.0  
1000 s: (267.0...276.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,0 h4
Edition : 12.02.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 648 866
Injection pump
Pump designation : PE8P120A920/4LS7125
EP type number : 0 412 628 833
Governor
Governor design. : RQV350...1050PA795-7
Governor no. : 0 421 813 768

Customer-spec. information
Customer : SCANIA

Engine : DS 14

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 019
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test Lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant. per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 5.00...5.10 : (4.95...5.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5- 6- 8

Phasing : 0-45-90-135-180-225-270-315
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
Rack travel in mm : 13.50...13.60
Del.quantity cm3/ : 21.4...21.6
100 s: (21.1...21.9)
Spread cm3 : 0.6
100 s: (0.9)

2nd speed rpm : 350.0
Rack travel in mm : 4.6...5.0
Del.quantity cm3/ : 1.5...1.9
100 s: (-)
Spread cm3 : 0.3
100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

2nd speed rpm : 350
travel mm : 1.30...1.70
3rd speed rpm : 650
travel mm : 4.10...4.70
4th speed rpm : 1095
travel mm : 7.80...8.00
5th speed rpm : 1215
travel mm : 9.10...9.50

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1170
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Aneroid pressure h: 900
Del.quantity : 214.0...216.0
1000 : (211.0...219.0)
Spread cm3 : 6.00
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 100...108

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 69...77

Testing:  
Speed rpm : 100  
Minimum rack travel: 10.50  
Speed rpm : 350  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 370...430

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 365  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 215  
Rack travel in m: 11.80...12.00

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 203.0...211.0  
1000 s: (201.0...213.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 1090...1100

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
Rack travel in mm : 20.00...21.00

## LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

## ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1990-01-11

Start of delivery - engine: 16° before  
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,2 n1  
 Edition : 12.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 867  
 Injection pump  
 Pump designation : PE8P120A920/4LS7166  
 EP type number : 0 412 628 832  
 Governor  
 Governor design. : RQ750PA758-7  
 Governor no. : 0 421 801 490

Customer-spec. information  
 Customer : SCANIA

Engine : DS 14

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.50...12.60  
 Del.quantity cm3/ : 25.2...25.4  
 100 s: (24.9...25.7)  
 Spread cm3 : 0.7  
 100 s: (1.0)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 252.0...254.0  
 1000 : (249.0...257.0)  
 Spread cm3 : 7.00  
 1000 : (10.00)

RATED SPEED

1st version  
 Testing:  
 1st rack travel in: 11.50  
 Speed rpm : 750...755  
 2nd rack travel in: 4.00  
 Speed rpm : 784...797  
 4th rack travel in: 850  
 Speed rpm : 0.00...1.00

Aneroid/Altitude  
 Compensator Test

1st version  
 Setting  
 Speed rpm : 500  
 Pressure hPa : 900  
 Rack travel mm : 12.50...12.60

Measurement  
 Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...10.10  
2nd pressure hPa : 365  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 215  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 750...755

#### HIGH IDLE

1st version  
Rack travel in mm : 5.00...5.20  
Spread cm<sup>3</sup> : 4.00  
1000 s: (7.00)

Remarks:  
:

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1990-01-11

Start of delivery - engine: 18° before  
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

#### APPLICATION

Generator

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,2 m1  
 Edition : 12.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 868  
 Injection pump  
 Pump designation : PE8P120A920/4LS7180  
 EP type number : 0 412 628 837  
 Governor  
 Governor design. : RQV350...1050PA795-8  
 Governor no. : 0 421 813 770

Customer-spec. information  
 Customer : SCANIA

Engine : DSI 14

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 019  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.20...13.30  
 Del.quantity cm<sup>3</sup>/ : 26.8...27.0  
 100 s: (26.5...27.3)  
 Spread cm<sup>3</sup> : 0.7  
 100 s: (1.0)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.5...4.9  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

2nd speed rpm : 350  
 travel mm : 1.30...1.70  
 3rd speed rpm : 650  
 travel mm : 4.10...4.70  
 4th speed rpm : 1145  
 travel mm : 7.80...8.00  
 5th speed rpm : 1255  
 travel mm : 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1325  
 Rack travel in mm : 6.00...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 268.0...270.0  
 1000 : (265.0...273.0)  
 Spread cm<sup>3</sup> : 7.00  
 1000 : (10.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 98...106

Testing:  
1st rack travel in: 12.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76

Testing:  
Speed rpm : 100  
Minimum rack travel: 10.30  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 370...430

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...10.10  
2nd pressure hPa : 365  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 215  
Rack travel in m: 10.80...11.00

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 258.0...266.0  
1000 s: (256.0...268.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1090...1100

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 110.0...150.0  
1000 s: (-)  
Rack travel in mm : 9.70...10.10

## LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

## ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1990-01-15

Start of delivery - engine: 20° before  
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 a20  
 Edition : 05.03.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 870  
 Injection pump  
 Pump designation : PE8P120A320LS7801-1  
 EP type number : 0 412 628 818  
 Governor  
 Governor design. : RQV350..1050PA866-6  
 Governor no. : 0 421 813 810

Customer spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.80...12.90

Del. quantity cm<sup>3</sup>/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...6.0

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.40...1.60

2nd speed rpm : 800

travel mm : 4.80...5.10

3rd speed rpm : 1100

travel mm : 7.70...8.10

4th speed rpm : 1175

travel mm : 9.00...9.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050  
Aneroid pressure h : 1100  
Del.quantity : 181.0...183.0  
1000 : (178.0...186.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 11.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 64...72

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.50  
Speed rpm : 350  
Rack travel in mm : 5.40...6.00

#### CONSTANT REGULATION

Speed rpm : 350...550

#### TORQUE CONTROL

Dimension a mm : 1.50  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 700  
Rack travel in m: 14.30...14.50  
3rd speed rpm : 950  
Rack travel in m: 13.50...13.60  
4th speed rpm : 830  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 11.00...11.30

##### Measurement

Speed 1/min : 600

1st pressure hPa : 420

Rack travel in m: 11.70...11.90  
2nd pressure hPa : 600  
Rack travel in m: 13.30...13.50

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1100  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 213.0...217.0  
1000 s: (210.0...220.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1100  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 152.0...154.0 \*  
1000 s: (149.0...157.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 143.0...145.0  
1000 s: (140.0...148.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (176.0...204.0)

Remarks:

:

\* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 a18  
 Edition : 05.03.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 871

Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RQ300/1050PA932  
 Governor no. : 0 421 801 494

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 260.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.00...14.20

Del.quantity cm3/ : 20.1...20.3  
 100 s: (19.8...20.6)

Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.0...6.4  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 500  
 Aneroid pressure h: 650  
 Del.quantity : 201.0...203.0  
 1000 : (198.0...206.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.75  
2nd speed rpm : 1050  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 850  
Rack travel in m: 13.70...14.00  
4th speed rpm : 700  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 400  
Rack travel in m: 13.40...13.70  
3rd pressure hPa : 850  
Rack travel in m: 14.20...14.30 \*  
4th pressure hPa : -  
Rack travel in m: 11.40...11.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1050  
Speed rpm : 1050  
Del.quantity cm3/ : 180.0...183.0  
1000 s: (177.0...186.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 700  
Del.quantity cm3/ : 215.0...219.0  
1000 s: (212.0...222.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1050  
Speed rpm : 850  
Del.quantity cm3/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

:

\* Increase in control-rod travel with respect to setting at least 0.1 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 p 1  
 Edition : 05.03.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 875

Injection pump  
 Pump designation : PE8P120A320LS7816-1  
 EP type number : 0 412 628 841  
 Governor  
 Governor design. : RQ300/1050PA717-2  
 Governor no. : 0 421 801 439

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

---

Rack travel in mm : 13.60...13.80

---

Del. quantity cm<sup>3</sup>/ : 23.4...23.7  
 100 s: (23.1...24.0)

---

Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.5  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEFVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 900  
 Del. quantity : 234.0...237.0  
 1000 : (231.0...240.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.30  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 14.30...14.50  
3rd speed rpm : 850  
Rack travel in m: 15.00...15.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 600  
1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050  
Rack travel in m: 13.70...13.90 \*  
4th pressure hPa : 1350  
Rack travel in m: 14.60...14.80  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 252.0...256.0  
1000 s: (249.0...259.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 850  
Del.quantity cm3/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 t
Edition : 12.04.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 648 876
Injection pump
Pump designation : PE8P120A320LS7816
EP type number : 0 412 628 829
Governor
Governor design. : RQ300/1050PA932-1
Governor no. : 0 421 801 509

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
: (5.15...5.35)
Rack travel in mm : 20.00...21.00
Firing order : 8- 7- 2- 6- 3- 5-
4- 1

Phasing : 0-45-90-135-180-225-
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm3/ : 23.4...23.7

100 s: (23.1...24.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEFVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 234.0...237.0

1000 : (231.0...240.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.30  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 14.30...14.50  
3rd speed rpm : 850  
Rack travel in m: 15.00...15.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 600  
1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050  
Rack travel in m: 13.70...13.90 \*  
4th pressure hPa : 1350  
Rack travel in m: 14.60...14.80  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1050

Del.quantity cm3/ : 252.0...256.0  
1000 s: (249.0...259.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 850  
Del.quantity cm3/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 10.20...10.50

Remarks:

:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a17  
 Edition : 01.02.90  
 Replaces : 1.12.89  
 Test oil : ISO-4113

Combination no. : 0 402 648 879

Injection pump  
 Pump designation : PE8P120A320LS7801-4  
 EP type number : 0 412 628 839  
 Governor  
 Governor design. : RQV350..1050PA842-5  
 Governor no. : 0 421 813 836

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.50...14.70

Del.quantity cm<sup>3</sup>/ : 21.2...21.4

100 s: (20.9...21.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.7...5.9  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.90...2.10  
 2nd speed rpm : 700  
 travel mm : 4.00...4.40  
 3rd speed rpm : 1100  
 travel mm : 6.80...7.20  
 4th speed rpm : 1200  
 travel mm : 8.30...8.70

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1185  
 Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 750  
Del.quantity : 212.0...214.0  
1000 : (209.0...217.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 14.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.40  
Speed rpm : 350  
Rack travel in mm : 5.50...6.10

CONSTANT REGULATION  
Speed rpm : 350...550

TORQUE CONTROL  
2nd speed rpm : 1050  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 975  
Rack travel in m: 15.40...15.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 750  
Rack travel mm : 14.50...14.70

Measurement  
Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 550  
Rack travel in m: 13.60...13.80  
3rd pressure hPa : 900  
Rack travel in m: 14.70...14.80  
4th pressure hPa : 1250

Rack travel in m: 15.40...15.60  
5th pressure hPa : -  
Rack travel in m: 11.60...11.80

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1250  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 227.0...230.0  
1000 s: (224.0...233.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1250  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 238.0...242.0  
1000 s: (235.0...245.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1250  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 156.0...159.0 \*  
1000 s: (153.0...162.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 150.0...152.0  
1000 s: (147.0...155.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks: :

\* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 a19
Edition : 02.02.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 648 880
Injection pump
Pump designation : PE8P120A320LS7801-1
EP type number : 0 412 628 818
Governor
Governor design. : RQ300/1050PA717
Governor no. : 0 421 801 258

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kw : 320.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
: (5.15...5.35)
Rack travel in mm : 20.00...21.00
Firing order : 8- 7- 2- 6- 3- 5-
4- 1

Phasing : 0-45-90-135-180-225-
270-315
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.70...14.90

Del.quantity cm3/ : 22.0...22.2

100 s: (21.7...22.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.7

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEFVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 680

Del.quantity : 220.0...222.0

1000 : (217.0...225.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.40  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.10...6.70  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.90  
2nd speed rpm : 1050  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 850  
Rack travel in m: 15.80...16.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 680  
Rack travel mm : 14.70...14.90

Measurement

Speed 1/min : 600

1st pressure hPa : 310  
Rack travel in m: 12.10...12.30  
2nd pressure hPa : 470  
Rack travel in m: 13.70...13.90  
3rd pressure hPa : 820  
Rack travel in m: 14.90...15.00  
4th pressure hPa : 1100  
Rack travel in m: 15.90...16.00  
5th pressure hPa : -  
Rack travel in m: 11.40...11.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1150  
Speed rpm : 1050  
Del.quantity cm3/ : 229.0...232.0  
1000 s: (226.0...235.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1150  
Speed rpm : 850  
Del.quantity cm3/ : 247.0...251.0  
1000 s: (244.0...254.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 149.0...151.0  
1000 s: (146.0...154.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.40  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 k 1  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : D 402 648 881  
 Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : D 412 628 829  
 Governor  
 Governor design. : RQV300..950PA797-13  
 Governor no. : D 421 813 841

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del. quantity cm<sup>3</sup>/ : 25.4...25.6

100 s: (25.1...25.9)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.40

2nd speed rpm : 700  
 travel mm : 5.50...6.00

3rd speed rpm : 1100  
 travel mm : 8.30...8.80

4th speed rpm : 1090  
 travel mm : 9.70...10.20

5th speed rpm : 1190  
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1000

Rack travel in mm : 16.20...18.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1000  
Del.quantity : 254.0...256.0  
1000 : (251.0...259.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 120...128

#### Testing:

1st rack travel in: 14.20  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 82...90

#### Testing:

Speed rpm : 200  
Minimum rack trave: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50

#### CONSTANT REGULATION

Speed rpm : 300...500

#### TORQUE CONTROL

Dimension a mm : 0.30  
2nd speed rpm : 950  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 800  
Rack travel in m: 15.50...15.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.60...14.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 12.00...12.20  
2nd pressure hPa : 700  
Rack travel in m: 13.80...14.00

3rd pressure hPa : 1200  
Rack travel in m: 14.80...15.00  
4th pressure hPa : 1500  
Rack travel in m: 15.60...15.80  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1600  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 270.0...273.0  
1000 s: (267.0...276.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks: :

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 a21  
 Edition : 01.02.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 882

Injection pump  
 Pump designation : PE8P120A320LS7801  
 EP type number : 0 412 628 806  
 Governor  
 Governor design. : RGV300..950PA797-14  
 Governor no. : 0 421 813 842

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 269.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...24.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.00...14.20

Del.quantity cm3/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.50

2nd speed rpm : 600

travel mm : 4.80...5.30

3rd speed rpm : 950

travel mm : 7.60...8.10

4th speed rpm : 1050

travel mm : 9.00...9.50

5th speed rpm : 1100

travel mm : 9.90...10.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 990

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 500  
Aneroid pressure h: 800  
Del.quantity : 201.0...203.0  
1000 : (198.0...206.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 117...125

Testing:  
1st rack travel in: 11.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 84...92

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40

CONSTANT REGULATION  
Speed rpm : 300...500

TORQUE CONTROL  
Dimension a mm : 0.30  
2nd speed rpm : 950  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 800  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 14.00...14.20

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.80...12.00  
2nd pressure hPa : 500  
Rack travel in m: 13.30...13.60

3rd pressure hPa : 950  
Rack travel in m: 14.10...14.20 \*  
4th pressure hPa : -  
Rack travel in m: 10.60...11.00

START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1150  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 190.0...193.0  
1000 s: (187.0...196.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1150  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 216.0...219.0  
1000 s: (213.0...222.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 138.0...140.0  
1000 s: (135.0...143.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MTU 14,6 a  
 Edition : 29.05.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 648 884

Injection pump  
 Pump designation : PE8P120A320LS7830  
 EP type number : 0 412 628 844  
 Governor  
 Governor design. : RQV350..1150PA870-4  
 Governor no. : 0 421 813 717

Customer-spec. information  
 Customer : MTU

Engine : 8V 183 TE92

1st version kW : 490.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
 : (4.35...4.55)  
 Rack travel in mm : 19.50...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.80...14.90

Del. quantity cm<sup>3</sup>/ : 31.0...31.2

100 s: (30.7...31.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.6

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.90...2.40

2nd speed rpm : 500

travel mm : 3.00...3.50

3rd speed rpm : 800

travel mm : 4.30...4.80

4th speed rpm : 1200

travel mm : 8.30...8.90

5th speed rpm : 1250

travel mm : 9.30...10.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Aneroid pressure h: 2000  
Del.quantity : 310.0...312.0  
1000 : (307.0...315.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

#### Testing:

1st rack travel in: 13.80  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 62...70

#### Testing:

Speed rpm : 250  
Minimum rack travel: 7.00  
Speed rpm : 350  
Rack travel in mm : 5.00...5.60

#### CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 7.10...7.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : 400  
Rack travel in m: 7.60...7.70  
2nd pressure hPa : 1200  
Rack travel in m: 11.80...12.10

#### START CUT-OUT

Speed 1/min : 310 (330)

#### FUEL DELIVERY CHARACTERISTICS

H02

1st version  
Aneroid pressure h: 2000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup> : 303.0...313.0  
1000 s: (300.0...316.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 2000  
Speed rpm : 1150  
Del.quantity cm<sup>3</sup> : 240.0...243.0 \*  
1000 s: (237.0...246.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup> : 120.0...122.0  
1000 s: (117.0...125.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup> : 320.0...340.0  
1000 s: (316.0...344.0)

Remarks:

:

\* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 t 1  
 Edition : 30.03.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 889  
 Injection pump  
 Pump designation : PE8P120A320LS7816  
 EP type number : 0 412 628 829  
 Governor  
 Governor design. : RQ300/950PA932-2  
 Governor no. : 0 421 801 526

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 362.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 14.60...14.80  
 Del.quantity cm<sup>3</sup>/ : 25.4...25.6  
 100 s: (25.1...25.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.5  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000  
 Del.quantity : 254.0...256.0  
 1000 : (251.0...259.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.20  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack trave: 7.80  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.90  
2nd speed rpm : 950  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 800  
Rack travel in m: 15.50...15.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 700  
Rack travel in m: 13.80...14.00  
3rd pressure hPa : 1200  
Rack travel in m: 14.80...15.00  
4th pressure hPa : 1500  
Rack travel in m: 15.60...15.80  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 950

Del.quantity cm3/ : 270.0...273.0  
1000 s: (267.0...276.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 270.0...274.0  
1000 s: (267.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.20  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 a22  
Edition : 12.04.90  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 890  
  
Injection pump  
Pump designation : PE8P120A320LS7801  
EP type number : 0 412 628 806  
Governor  
Governor design. : RQ300/950PA932-4  
Governor no. : 0 421 801 533

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 269.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                  : (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.00...14.20

Del.quantity cm<sup>3</sup>/ : 20.1...20.3

100 s : (19.8...20.6)

Spread cm<sup>3</sup> : 0.5

100 s : (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s : (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s : (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 800

Del.quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.75  
2nd speed rpm : 950  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 800  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 14.00...14.20

Measurement

Speed 1/min : 600  
1st pressure hPa : 350  
Rack travel in m: 11.80...12.00  
2nd pressure hPa : 500  
Rack travel in m: 13.30...13.60  
3rd pressure hPa : 950  
Rack travel in m: 14.10...14.20 \*  
4th pressure hPa : -  
Rack travel in m: 10.60...11.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

HD6

Aneroid pressure h: 1150  
Speed rpm : 950  
Del.quantity cm3/ : 190.0...193.0  
1000 s: (187.0...196.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1150  
Speed rpm : 750  
Del.quantity cm3/ : 216.0...219.0  
1000 s: (213.0...222.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 138.0...140.0  
1000 s: (135.0...143.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...190.0  
1000 s: (171.0...194.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 18,3 L 3  
 Edition : 01.02.90  
 Replaces : 24.11.89  
 Test oil : ISO-4113

Combination no. : 0 402 649 810

Injection pump  
 Pump designation : PE10P120A320LS7809  
 EP type number : 0 412 629 800  
 Governor  
 Governor design. : RQV350..1050PA870-6  
 Governor no. : 0 421 813 766

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM443 LA

1st version kW : 401.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 130...150

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 10- 9- 4- 1- 8- 7  
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.30...14.50

Del.quantity cm<sup>3</sup>/ : 21.0...21.4  
 100 s: (20.7...21.7)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.2...6.8  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.90...2.10  
 2nd speed rpm : 700  
 travel mm : 4.10...4.50  
 3rd speed rpm : 1100  
 travel mm : 7.60...8.00  
 4th speed rpm : 1200  
 travel mm : 9.50...9.90

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1100  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 750  
Del. quantity : 210.0...214.0  
1000 : (207.0...217.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

#### Testing:

1st rack travel in: 14.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 64...-72

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.60  
Speed rpm : 350  
Rack travel in mm : 6.20...6.80

#### CONSTANT REGULATION

Speed rpm : 300...400

#### TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 15.10...15.30  
3rd speed rpm : 800  
Rack travel in m: 15.50...15.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.30...14.50

#### Measurement

Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 550  
Rack travel in m: 13.20...13.40  
3rd pressure hPa : 960  
Rack travel in m: 14.40...14.50 \*

4th pressure hPa : 1100  
Rack travel in m: 14.80...15.00  
5th pressure hPa : -  
Rack travel in m: 11.10...11.40

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1300  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 224.0...226.0  
1000 s: (221.0...229.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1300  
Speed rpm : 850  
Del. quantity cm<sup>3</sup>/ : 232.0...236.0  
1000 s: (229.0...239.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1300  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 168.0...170.0  
1000 s: (165.0...173.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 132.0...136.0  
1000 s: (129.0...139.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (-)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 14.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

#### Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 18,2 j  
 Edition : 19.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 649 811  
 Injection pump  
 Pump designation : PE10P120A520LS7831  
 EP type number : 0 412 629 806  
 Governor  
 Governor design. : RQ300/950PA950  
 Governor no. : 0 421 801 520

Customer-spec. information  
 Customer : MAN

Engine : D 2840 LF

1st version kW : 368.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 13.00...14.00  
 Firing order : 10- 9- 4- 1- 8- 7  
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 7.90...8.10  
 & maximum rack tra: 13.0...14.0  
 Difference ° CS : 0.25...2.75

BASIC SETTING

1st speed rpm : 950  
 Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 22.9...23.1  
 100 s: (22.6...23.4)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.0...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: 108  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 950  
 Aneroid pressure h: 1000  
 Del.quantity : 229.0...231.0  
 1000 : (226.0...234.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.50  
Speed rpm : 995...1010  
2nd rack travel in: 4.00  
Speed rpm : 1040...1070  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 370...410

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 950  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 600  
Rack travel in m: 13.70...13.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 200  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 500  
Rack travel in m: 12.70...13.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 222.0...228.0  
1000 s: (219.0...231.0)  
Speed rpm : 600  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 151.0...153.0  
1000 s: (148.0...156.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 995...1010

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...190.0  
1000 s: (166.0...194.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.40  
Del.quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MAN-NR. 3-7014

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 18,2 k  
 Edition : 29.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 649 812  
 Injection pump  
 Pump designation : PE10P120A520LS7831  
 EP type number : 0 412 629 806  
 Governor  
 Governor design. : RQV300...950PA949  
 Governor no. : 0 421 813 855

Customer-spec. information  
 Customer : MAN

Engine : D 2840 LF

1st version kW : 368.0  
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 13.00...14.00  
 Firing order : 10- 9- 4- 1- 8- 7  
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.40...5.60  
 & maximum rack tra: 13.0...14.0  
 Difference ° CS : 1.25...2.75

BASIC SETTING

1st speed rpm : 950

Rack travel in mm : 13.50...13.60

Del. quantity cm<sup>3</sup>/ : 22.9...23.1

100 s: (22.6...23.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.0...5.4

Del. quantity cm<sup>3</sup>/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 995

travel mm : 10.10...10.30

2nd speed rpm : 300

travel mm : 1.20...1.40

3rd speed rpm : 800

travel mm : 6.40...6.80

4th speed rpm : 1200

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1000

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950  
Aneroid pressure h: 1000  
Del. quantity : 229.0...231.0  
1000 : (226.0...234.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 12.50  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 58...66

Testing:

Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30

## CONSTANT REGULATION

Speed rpm : 310...430

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.50...13.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 200  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 500  
Rack travel in m: 12.70...13.00

## START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 222.0...228.0  
1000 s: (219.0...231.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 151.0...153.0  
1000 s: (148.0...156.0)

## BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 990...1000

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 170.0...190.0  
1000 s: (166.0...194.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.40  
Del. quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7015



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 21,9 j 1  
 Edition : 19.06.90  
 Replaces : 30.3.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 670 804  
  
 Injection pump  
 Pump designation : PE12P120A320LS7813-1  
 EP type number : 0 412 620 811  
 Governor  
 Governor design. : RSV350...750POA825-5  
 Governor no. : 0 421 833 277

### Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM 444 LA

1st version kw : 441.0  
 Rated speed : 1500

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

### BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 16.50...16.60

Del.quantity cm<sup>3</sup>/ : 28.0...28.2

100 s: (27.7...28.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.9

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.40

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 280.0...282.0

1000 : (277.0...285.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Control lever

position degrees: 20...28

Testing:

1st rack travel in: 15.50  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 900  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 9...17  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7  
Speed rpm : 350  
Rack travel in mm : 5.50...5.90

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:

Observe VDT-I-420/120

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 22,0 d  
 Edition : 06.04.90  
 Replaces : 13.12.89  
 Test oil : ISO-4113

Combination no. : 0 402 670 807

Injection pump  
 Pump designation : PE12P120A320LS7814-1  
 EP type number : 0 412 620 819  
 Governor  
 Governor design. : RSV375..1050POA535-3  
 Governor no. : 0 421 833 328

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kw : 588.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 150...170

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 12- 1- 5- 9- 8- 3-  
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
 180-225-240-285-300-  
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 13.90...14.10

Del.quantity cm<sup>3</sup>/ : 26.2...26.5

100 s: (25.9...26.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 375.0

Rack travel in mm : 5.1...5.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650

Aneroid pressure h: 1100

Del.quantity : 262.0...265.0

1000 : (259.0...268.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Testing:

1st rack travel in: 12.90  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 5.2

Testing:

Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 375  
Rack travel in mm : 5.10...5.40

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 13.70...13.90  
2nd speed rpm : 950  
Rack travel in m: 14.20...14.40  
3rd speed rpm : 850  
Rack travel in m: 14.40...14.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1050  
Rack travel mm : 13.90...14.10

Measurement

Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 9.30...9.50  
2nd pressure hPa : 650  
Rack travel in m: 12.10...12.30  
3rd pressure hPa : 1370  
Rack travel in m: 14.10...14.30  
4th pressure hPa : -  
Rack travel in m: 8.20...8.60

FUEL DELIVERY CHARACTERISTICS

1st version

H17

Aneroid pressure h: 1800  
Speed rpm : 1030  
Del.quantity cm3/ : 261.0...264.0  
1000 s: (258.0...267.0)  
Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1800  
Speed rpm : 750  
Del.quantity cm3/ : 279.0...282.0  
1000 s: (276.0...285.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm3/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

On activation of the starting solenoid,  
the start position must be reached.

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 k1  
 Edition : 12.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 676 808  
 Injection pump  
 Pump designation : PE6P120A72ORS7126  
 EP type number : 0 412 626 815  
 Governor  
 Governor design. : RSV350...1050P1A543  
 Governor no. : 0 421 833 310

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS11 54,57

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 14.10...14.20  
 Del.quantity cm<sup>3</sup>/ : 23.4...23.6  
 100 s: (23.1...23.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.3...4.7  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 234.0...236.0  
 1000 : (231.0...239.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 108...116

Testing:  
 1st rack travel in: 13.10  
 Speed rpm : 1090...1100  
 2nd rack travel in: 4.00  
 Speed rpm : 1165...1195

4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 3.9

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.30...4.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1000  
Del.quantity cm3/ : 223.0...231.0  
1000 s: (221.0...233.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.30...4.50

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 k  
 Edition : 12.01.90  
 Replaces : -  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 676 809  
  
 Injection pump  
 Pump designation : PE6P120A720RS7126  
 EP type number : 0 412 626 815  
 Governor  
 Governor design. : RSV350...1050P1A543-  
 1  
 Governor no. : 0 421 833 325  
  
 Customer-spec. information  
 Customer : SCANIA  
  
 Engine : DS11 54,57

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve  
 : 1 417 413 025  
  
 Inlet press., bar : 1.50  
  
 Test nozzle holder  
 assembly : 1 688 901 019  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,8  
  
 Test lines : 1 680 750 015  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
 Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

H2O

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  


---

 Rack travel in mm : 14.10...14.20  


---

 Del.quantity cm<sup>3</sup>/ : 23.4...23.6  


---

 100 s: (23.1...23.9)  


---

 Spread cm<sup>3</sup> : 0.6  


---

 100 s: (0.9)  


---

2nd speed rpm : 350.0  
 Rack travel in mm : 4.3...4.7  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 234.0...236.0  
 1000 : (231.0...239.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 108...116

Testing:  
 1st rack travel in: 13.10  
 Speed rpm : 1090...1100

2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 3.9

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.30...4.50  
Rack travel in mm : 2.00  
Speed rpm : 430...490

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.90  
2nd pressure hPa : 510  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 250  
Rack travel in m: 11.40...11.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 223.0...231.0  
1000 s: (221.0...233.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 150.0...154.0  
1000 s: (148.0...156.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10

H21

Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 275.0...325.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.30...4.50

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 14, 1989

Start of delivery - engine: 16° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,0 i1  
 Edition : 12.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 678 813  
 Injection pump  
 Pump designation : PE8P120A920/4LS7125  
 EP type number : 0 412 628 833  
 Governor  
 Governor design. : RSV35D...1050P1A512-  
 2  
 Governor no. : 0 421 833 324

Customer-spec. information  
 Customer : SCANIA

Engine : DS 14

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 7- 3- 4- 5-  
 6- 8

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.50...13.60  
 Del.quantity cm<sup>3</sup>/ : 21.4...21.6  
 100 s: (21.1...21.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.6...5.0  
 Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
 100 s: (-)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 900  
 Del.quantity : 214.0...216.0  
 1000 : (211.0...219.0)  
 Spread cm<sup>3</sup> : 6.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 94...102

Testing:  
 1st rack travel in: 12.50

Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.50...13.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.60  
2nd pressure hPa : 365  
Rack travel in m: 12.80...12.90  
3rd pressure hPa : 215  
Rack travel in m: 11.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 203.0...211.0  
1000 s: (201.0...213.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 158.0...162.0  
1000 s: (156.0...164.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...290.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.60...4.80

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1990-01-11

Start of delivery - engine: 16° before  
TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 10,0 c  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 735 800  
 Injection pump  
 Pump designation : PES5P120A720/3LS7210  
 EP type number : 0 412 725 808  
 Governor  
 Governor design. : RQV325...1000PA962K  
 Governor no. : 0 412 725 808

Customer-spec. information  
 Customer : MAN

Engine : D2865LF03

1st version kW : 235.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 15.00...16.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60  
 & maximum rack tra: 15.0...16.0  
 Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.10...13.20

Del. quantity cm<sup>3</sup>/ : 25.7...25.9

100 s: (25.4...26.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del. quantity cm<sup>3</sup>/ : 4.7...5.3

100 s: (4.4...5.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
 travel mm : 7.70...7.90

2nd speed rpm : 325  
 travel mm : 2.10...2.30

3rd speed rpm : 500  
 travel mm : 4.10...4.50

4th speed rpm : 900  
 travel mm : 6.40...6.80

5th speed rpm : 1350  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del. quantity : 257.0...259.0  
1000 : (254.0...262.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 283...291

Testing:

1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 240...248

Testing:

Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

Speed rpm : 340...450

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.10...13.20  
2nd speed rpm : 1000  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 650  
Rack travel in m: 12.40...12.60  
4th speed rpm : 400  
Rack travel in m: 11.50...11.80

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.10...13.20

Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 8.60...8.80  
2nd pressure hPa : 170  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 600  
Rack travel in m: 11.30...11.50

START CUT-OUT

Speed 1/min : 245 (265)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del. quantity cm<sup>3</sup>/ : 238.0...242.0  
1000 s: (235.0...245.0)  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 259.0...265.0  
1000 s: (256.0...268.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 154.0...156.0  
1000 s: (151.0...159.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Del. quantity cm<sup>3</sup>/ : 47.0...53.0  
1000 s: (44.0...56.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7048

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 10,0 c1
Edition : 06.07.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 735 801
Injection pump
Pump designation : PES5P120A720/3LS7210
EP type number : 0 412 725 808
Governor
Governor design. : RQV325...1000PA960K
Governor no. : 0 412 725 808

Customer-spec. information
Customer : MAN

Engine : D2865LF03
1st version kW : 235.0
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 105
Opening pressure, bar : 207...210
Orifice plate diameter mm : 0,8
Test lines : 1 680 750 015
Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant. per values

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90
: (4.75...4.95)
Rack travel in mm : 15.00...16.00
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 5

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60
& maximum rack tra: 15.0...16.0
Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed rpm : 900
Rack travel in mm : 13.10...13.20
Del. quantity cm3/ : 25.7...25.9
100 s: (25.4...26.2)
Spread cm3 : 0.5
100 s: (0.9)
2nd speed rpm : 300.0
Rack travel in mm : 5.9...6.1
Del. quantity cm3/ : 4.7...5.3
100 s: (4.4...5.6)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045
travel mm : 9.40...9.60
2nd speed rpm : 325
travel mm : 1.30...1.50
3rd speed rpm : 500
travel mm : 3.20...3.80
4th speed rpm : 900
travel mm : 7.60...8.00
5th speed rpm : 1350
travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1110
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 257.0...259.0  
1000 : (254.0...262.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 293...301

Testing:

1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1125...1155  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 249...257

Testing:

Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

Speed rpm : 340...450

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.10...13.20  
2nd speed rpm : 1000  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 650  
Rack travel in m: 12.40...12.60  
4th speed rpm : 400  
Rack travel in m: 11.60...11.90

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.10...13.20

Measurement

Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.60...8.80  
2nd pressure hPa : 170  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 600  
Rack travel in m: 11.30...11.50

START CUT-OUT

Speed 1/min : 245 (265)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 238.0...242.0  
1000 s: (235.0...245.0)  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 259.0...265.0  
1000 s: (256.0...268.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 154.0...156.0  
1000 s: (151.0...159.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 47.0...53.0  
1000 s: (44.0...56.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7049

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : CUM 5,9 w  
 Edition : 08.06.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 736 806

Injection pump  
 Pump designation : PES6P110A120RS7213  
 EP type number : 0 412 716 804  
 Governor  
 Governor design. : RQV400...1250PA964-K  
 Governor no. : 0 421 815 252

Customer-spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 171.5  
 Rated speed : 2500

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 90...100

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 15.50...15.60

Del. quantity cm<sup>3</sup>/ : 16.5...16.7

100 s: (16.3...16.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 3.3...3.7

100 s: (3.1...3.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 0.70...1.10

2nd speed rpm : 400  
 travel mm : 1.40...1.60

3rd speed rpm : 600  
 travel mm : 3.00...3.20

4th speed rpm : 1300  
 travel mm : 7.20...7.40

5th speed rpm : 1500  
 travel mm : 9.20...9.40

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1200

Del. quantity : 165.5...167.5

1000 : (163.5...169.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 14.50  
Speed rpm : 1295...1305  
2nd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 400  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : 1.70  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 15.50...15.60  
2nd speed rpm : 800  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 700  
Rack travel in m: 13.80...14.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 15.50...15.60

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 7.60...8.00  
2nd pressure hPa : 400  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 800  
Rack travel in m: 13.40...13.80

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 177.0...181.0  
1000 s: (175.0...183.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 82.5...86.5  
1000 s: (80.5...88.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.50  
Speed rpm : 1295...1305

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 155.0...175.0  
1000 s: (150.0...180.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 33.0...37.0  
1000 s: (31.0...39.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3913440  
Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r  
 Edition : 08.06.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 736 807

Injection pump  
 Pump designation : PES6P110A120RS7214  
 EP type number : 0 412 716 805  
 Governor  
 Governor design. : RQV350...1100PA964-1  
 K  
 Governor no. : 0 421 815 253

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CTA-A  
 1st version kW : 201.0

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 90...100

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
 : (4.30...4.50)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

---

Rack travel in mm : 15.50...15.60

---

Del.quantity cm<sup>3</sup>/ : 16.5...16.7  
 100 s: (16.3...16.9)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 400.0  
 Rack travel in mm : 5.4...5.6  
 Del.quantity cm<sup>3</sup>/ : 3.3...3.7  
 100 s: (3.1...3.9)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 450  
 travel mm : 3.20...3.40  
 3rd speed rpm : 600  
 travel mm : 5.20...5.40  
 4th speed rpm : 1000  
 travel mm : 8.10...8.30  
 5th speed rpm : 1200  
 travel mm : 9.60...10.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Aneroid pressure h: 1200  
 Del.quantity : 165.5...167.5  
 1000 : (163.5...169.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 14.50  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1310...1340  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 400  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 15.50...15.60  
2nd speed rpm : 800  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 700  
Rack travel in m: 13.80...14.20

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 15.50...15.60

#### Measurement

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 7.60...8.00  
2nd pressure hPa : 400  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 800  
Rack travel in m: 13.40...13.80

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 177.0...181.0  
1000 s: (175.0...183.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 82.5...86.5  
1000 s: (80.5...88.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 14.50  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 155.0...175.0  
1000 s: (150.0...180.0)  
Rack travel in mm : 12.40...13.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 33.0...37.0  
1000 s: (31.0...39.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: C.D.C. # 3916627  
Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 t  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 736 808

Injection pump  
 Pump designation : PES6P120A720/3LS7209  
 EP type number : 0 412 726 837  
 Governor  
 Governor design. : RQV300...1000PA962-1  
 K  
 Governor no. : 0 421 815 248

Customer-spec. information  
 Customer : MAN

Engine : D2866LF06

1st version kW : 309.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 15.00...16.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60  
 & maximum rack tra: 15.0...16.0  
 Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 29.3...29.5

100 s: (29.0...29.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.8...5.2

Del.quantity cm<sup>3</sup>/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045

travel mm : 8.40...8.60

2nd speed rpm : 300

travel mm : 2.10...2.30

3rd speed rpm : 500

travel mm : 4.10...4.50

4th speed rpm : 900

travel mm : 6.50...6.90

5th speed rpm : 1350

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 293.0...295.0  
1000 : (290.0...298.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 284...292

Testing:

1st rack travel in: 12.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1125...1155  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 240...248

Testing:

Speed rpm : 100  
Minimum rack trave: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 320...440

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1000  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 750  
Rack travel in m: 13.30...13.50  
4th speed rpm : 400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.70...8.90  
2nd pressure hPa : 220  
Rack travel in m: 9.10...9.20  
3rd pressure hPa : 720  
Rack travel in m: 11.40...11.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 267.0...271.0  
1000 s: (264.0...274.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 282.0...288.0  
1000 s: (279.0...291.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 166.0...168.0  
1000 s: (163.0...171.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 2-7987

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 t1  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 809  
 Injection pump  
 Pump designation : PES6P120A720/3LS7209  
 EP type number : 0 412 726 837  
 Governor  
 Governor design. : RQV300...1000PA960-2  
 K  
 Governor no. : 0 421 815 249

Customer-spec. information  
 Customer : MAN

Engine : D2866LF06

1st version kW : 309.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
 : (4.75...4.95)  
 Rack travel in mm : 15.00...16.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60  
 & maximum rack tra: 15.0...16.0  
 Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 29.3...29.5

100 s: (29.0...29.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.8...5.2

Del.quantity cm<sup>3</sup>/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
 travel mm : 9.60...9.80

2nd speed rpm : 300  
 travel mm : 1.50...1.70

3rd speed rpm : 500  
 travel mm : 3.50...4.10

4th speed rpm : 900  
 travel mm : 7.70...8.10

5th speed rpm : 1350  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 293.0...295.0  
1000 : (290.0...298.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 293...301

Testing:

1st rack travel in: 12.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 247...255

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 300...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 1000  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 750  
Rack travel in m: 13.30...13.50  
4th speed rpm : 400  
Rack travel in m: 10.70...11.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 8.70...8.90

2nd pressure hPa : 220

Rack travel in m: 9.10...9.20

3rd pressure hPa : 720

Rack travel in m: 11.40...11.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 267.0...271.0  
1000 s: (264.0...274.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 282.0...288.0  
1000 s: (279.0...291.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 166.0...168.0  
1000 s: (163.0...171.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.80...5.20  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7052

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 10,0 r  
 Edition : 19.06.90  
 Replaces : 2.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 745 807

Injection pump  
 Pump designation : PES5P120A720LS7174  
 EP type number : 0 412 725 806  
 Governor  
 Governor design. : RQ300/1050PA774-2  
 Governor no. : 0 421 801 450

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM449 A

1st version kW : 184.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm<sup>3</sup>/ : 19.6...19.8

100 s: (19.3...20.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...7.0

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 650

Del.quantity : 196.0...198.0

1000 : (193.0...201.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.7

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.70  
Speed rpm : 300  
Rack travel in mm : 6.40...7.00  
Rack travel in mm : 2.00  
Speed rpm : 370...410

#### TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 14.40...14.60  
2nd speed rpm : 750  
Rack travel in m: 14.90...15.10

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.10...14.30

#### Measurement

Speed 1/min : 600  
1st pressure hPa : 250  
Rack travel in m: 12.20...12.40  
2nd pressure hPa : 400  
Rack travel in m: 13.50...13.70  
3rd pressure hPa : 750  
Rack travel in m: 14.20...14.30 \*  
4th pressure hPa : 850  
Rack travel in m: 14.60...14.80  
5th pressure hPa : -  
Rack travel in m: 11.90...12.20

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 208.0...211.0  
1000 s: (205.0...214.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 216.0...220.0  
1000 s: (213.0...223.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 150.0...152.0  
1000 s: (147.0...155.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 10,0 m 3  
 Edition : 17.05.90  
 Replaces : 2.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 745 809  
 Injection pump  
 Pump designation : PES5P120A720LS7160  
 EP type number : 0 412 725 802  
 Governor  
 Governor design. : RQV300..1050PA940  
 Governor no. : 0 421 813 824

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM449 A

1st version kw : 184.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm<sup>3</sup>/ : 19.6...19.8

100 s: (19.3...20.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...7.1

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.30

2nd speed rpm : 600  
 travel mm : 4.90...5.10

3rd speed rpm : 800  
 travel mm : 5.80...6.10

4th speed rpm : 1100  
 travel mm : 8.20...8.60

5th speed rpm : 1175  
 travel mm : 9.50...10.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 650  
Del.quantity : 196.0...198.0  
1000 : (193.0...201.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 13.60  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.80  
Speed rpm : 300  
Rack travel in mm : 6.50...7.10

#### CONSTANT REGULATION

Speed rpm : 300...400

#### TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 14.50...14.70  
2nd speed rpm : 750  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 900  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 13.10...13.30

#### Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 11.20...11.40

2nd pressure hPa : 400  
Rack travel in m: 12.50...12.70  
3rd pressure hPa : 750  
Rack travel in m: 13.20...13.30 \*  
4th pressure hPa : 850  
Rack travel in m: 13.60...13.80  
5th pressure hPa : -  
Rack travel in m: 11.90...12.20

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 208.0...211.0  
1000 s: (205.0...214.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 216.0...220.0  
1000 s: (213.0...223.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 150.0...152.0  
1000 s: (147.0...155.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.60  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER 12,2 a
Edition : 12.04.90
Replaces : 1.9.87
Test oil : ISO-4113
Combination no. : 0 402 746 807
Injection pump
Pump designation : PES6P120A72ORS7121
EP type number : 0 412 726 804
Governor
Governor design. : RQV250...950PA793-1
Governor no. : 0 421 813 591

Customer-spec. information
Customer : PERKINS

Engine : EAGLE LE

1st version kW : 300.0
Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90
: (4.75...4.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.8...5.0

Del.quantity cm3/ : 1.3...1.7

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.10...1.20

2nd speed rpm : 300

travel mm : 1.70...2.00

3rd speed rpm : 500

travel mm : 3.00...3.30

4th speed rpm : 1000

travel mm : 8.20...8.40

5th speed rpm : 1070

travel mm : 9.30...9.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1010

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 209.0...211.0  
1000 : (206.0...214.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 11.60  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 77...85

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 250  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 250...350

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.10...11.20  
2nd pressure hPa : 510  
Rack travel in m: 12.20...12.30  
3rd pressure hPa : 350  
Rack travel in m: 11.40...11.60

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version

J13

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 160.0...164.0  
1000 s: (158.0...166.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
Spread cm<sup>3</sup> : 3.00  
1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a  
 Edition : 02.05.90  
 Replaces : 30.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 810  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848K  
 Governor no. : 0 421 815 168

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 350 4VH

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  


---

 Rack travel in mm : 13.90...14.00  


---

 Del.quantity cm<sup>3</sup>/ : 23.6...23.8  
 100 s: (23.3...24.1)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.0...4.2  
 Del.quantity cm<sup>3</sup>/ : 3.2...3.8  
 100 s: (3.0...4.0)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.10...3.30  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 900  
 Del.quantity : 236.5...238.5  
 1000 : (233.5...241.5)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 12.90  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack trave: 5.60  
Speed rpm : 325  
Rack travel in mm : 4.00...4.20

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 625  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.10  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 275  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570  
Rack travel in m: 12.30...12.70

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm3/ : 257.0...263.0  
1000 s: (254.0...266.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 142.0...146.0  
1000 s: (140.0...148.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 8.50...8.90

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.00...4.20  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173P10

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a1
Edition : 02.05.90
Replaces : 31.10.89
Test oil : ISO-4113
Combination no. : 0 402 746 814
Injection pump
Pump designation : PES6P120A72ORS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...850PA848-1K
Governor no. : 0 421 815 169

Customer-spec. information
Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kw : 224.0
Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.5...202.5

1000 : (197.5...205.5)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 52...60

Testing:

1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:

Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 600  
Rack travel in m: 13.50...13.70  
4th speed rpm : 500  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 250  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 475  
Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

J17

1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 217.0...223.0  
1000 s: (214.0...226.0)  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173P6

Delivery-valve spring pre-tension  
3.0...3.2 mm.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a2  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 815  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA848-2K  
 Governor no. : 0 421 815 170

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 275 4VH

1st version kW : 202.0  
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 181.0...183.0

1000 : (178.0...186.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.00  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 700  
Rack travel in m: 12.50...12.70  
4th speed rpm : 500  
Rack travel in m: 0.00...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 360  
Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 210.5...216.5  
1000 s: (207.5...219.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 144.0...148.0  
1000 s: (142.0...150.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.50...9.90

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: MACK # 313GC5173P2

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a3  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 816

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-3K  
 Governor no. : 0 421 815 171

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM6-250L 4VH

1st version kW : 186.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control Lever  
position degrees: 52...60

Testing:  
1st rack travel in: 9.80  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 510  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 700  
Rack travel in m: 11.60...11.80  
4th speed rpm : 550  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.20

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.10...9.50  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435  
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 240.0...246.0  
1000 s: (237.0...249.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 146.0...150.0  
1000 s: (144.0...152.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 165.0...205.0  
1000 s: (155.0...215.0)  
Rack travel in mm : 9.10...9.50

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: MACK # 313GC5173P18

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a4  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 817

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848-4K  
 Governor no. : 0 421 815 173

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : EC6 350 4VH

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow quantity min. 1/h: 160...170

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant. per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.20...15.30

Del.quantity cm3/ : 25.0...25.2

100 s: (24.7...25.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 3.10...3.30

3rd speed rpm : 850

travel mm : 5.90...6.10

4th speed rpm : 1000

travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 250.5...252.5

1000 : (247.5...255.5)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 56...64

Testing:

1st rack travel in: 14.20  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:

Speed rpm : 275  
Minimum rack travel: 6.50  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.20...15.30  
2nd speed rpm : 625  
Rack travel in m: 15.50...15.60  
3rd speed rpm : 700  
Rack travel in m: 15.40...15.60  
4th speed rpm : 500  
Rack travel in m: 0.00...15.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 15.50...15.60

Measurement

Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 280  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 650  
Rack travel in m: 13.60...14.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 278.0...284.0  
1000 s: (275.0...287.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
1000 s: (110.0...170.0)  
Rack travel in mm : 8.60...9.00

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P14

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a5  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 818  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-5K  
 Governor no. : 0 421 815 174

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : EM 6 275L 4VH

1st version kW : 202.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del. quantity cm<sup>3</sup>/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del. quantity cm<sup>3</sup>/ : 3.7...4.3

100 s: (3.5...4.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del. quantity : 190.0...192.0

1000 : (187.0...195.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 52...60

Testing:

1st rack travel in: 11.20  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 9...17

Testing:

Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 510  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 700  
Rack travel in m: 13.20...13.40  
4th speed rpm : 400  
Rack travel in m: 0.00...13.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 280  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 485  
Rack travel in m: 12.70...13.30

FUEL DELIVERY CHARACTERISTICS

J25

1st version

Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 262.5...268.5  
1000 s: (259.5...271.5)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 145.0...149.0  
1000 s: (143.0...151.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.40...9.60

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P22

Delivery-valve spring pre-tension  
3.0...3.2 mm.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a6  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 819

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-6K  
 Governor no. : 0 421 815 175

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM6-225L 4VH

1st version kw : 165.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

---

Rack travel in mm : 11.00...11.10

---

Del. quantity cm<sup>3</sup>/ : 15.8...16.0  
 100 s: (15.5...16.3)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.6...4.8  
 Del. quantity cm<sup>3</sup>/ : 3.8...4.4  
 100 s: (3.6...4.6)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 850  
 travel mm : 6.20...6.40  
 4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del. quantity : 158.5...160.5  
 1000 : (155.5...163.5)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 10.00  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1015...1045  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.20  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 510  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 700  
Rack travel in m: 11.80...12.00  
4th speed rpm : 600  
Rack travel in m: 12.50...12.70  
5th speed rpm : 350  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.20...13.40

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 220  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 500  
Rack travel in m: 12.00...12.40

J27

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 234.0...240.0  
1000 s: (231.0...243.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 131.0...135.0  
1000 s: (129.0...137.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 925...935

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.50...8.90

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173P26

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b5  
 Edition : 02.05.90  
 Replaces : 7.10.88  
 Test oil : ISO-4113

Combination no. : 0 402 746 820

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA878K  
 Governor no. : 0 421 815 177

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E6 275 4VH

1st version kW : 202.0  
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 181.0...183.0

1000 : (178.0...186.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 52...60

Testing:

1st rack travel in: 11.00  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:

Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 700  
Rack travel in m: 12.50...12.70  
4th speed rpm : 500  
Rack travel in m: 0.00...12.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 360  
Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

K01

1st version

Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 210.5...216.5  
1000 s: (207.5...219.5)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 144.0...148.0  
1000 s: (142.0...150.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 900...910

INTERMEDIATE RATED SPEED

Rack travel in mm : 11.30  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.50...9.90

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P4

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b  
 Edition : 02.05.90  
 Replaces : 8.4.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 821  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA878-1K  
 Governor no. : 0 421 815 178

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E6 300 4VH

1st version kW : 224.0  
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.5...202.5

1000 : (197.5...205.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 600  
Rack travel in m: 13.50...13.70  
4th speed rpm : 500  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 250  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 475  
Rack travel in m: 12.60...13.00

## FUEL DELIVERY CHARACTERISTICS

K03

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 217.0...223.0  
1000 s: (214.0...226.0)  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 900...910

INTERMEDIATE RATED SPEED  
Rack travel in mm : 12.00  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300.0

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 9.90...10.30

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P8

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b1  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 822  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA878-2K  
 Governor no. : 0 421 815 179

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E6 350 4VH

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.0...4.2

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 3.10...3.30

3rd speed rpm : 850

travel mm : 5.90...6.10

4th speed rpm : 1000

travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 236.5...238.5

1000 : (233.5...241.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 55...63

### Testing:

1st rack travel in: 12.90  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 7...15

### Testing:

Speed rpm : 275  
Minimum rack travel: 5.60  
Speed rpm : 325  
Rack travel in mm : 4.00...4.20

## CONSTANT REGULATION

Speed rpm : 325...520

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 625  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.10  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 625  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

## Measurement

Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 275  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570  
Rack travel in m: 12.30...12.70

## FUEL DELIVERY CHARACTERISTICS

K05

## 1st version

Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm3/ : 257.0...263.0  
1000 s: (254.0...266.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 136.0...140.0  
1000 s: (134.0...142.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 950...960

## INTERMEDIATE RATED SPEED

Rack travel in mm : 13.00  
Speed rpm : 805  
Rack travel in mm : 4.10  
Speed rpm : 300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...180.0  
1000 s: (130.0...190.0)  
Rack travel in mm : 8.30...8.70

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.00...4.20  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

## Remarks:

: MACK # 313GC5173-P12

Delivery-valve spring pre-tension  
3.0...3.2 mm.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b2  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 823  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA878-3K  
 Governor no. : 0 421 815 180

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : EM6 275L 4VH

1st version kW : 202.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del. quantity cm<sup>3</sup>/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del. quantity cm<sup>3</sup>/ : 3.7...4.3

100 s: (3.5...4.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del. quantity : 190.0...192.0  
 1000 : (187.0...195.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.20  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.20  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 510  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 700  
Rack travel in m: 13.20...13.40  
4th speed rpm : 400  
Rack travel in m: 0.00...13.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 280  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 485  
Rack travel in m: 12.70...13.30

FUEL DELIVERY CHARACTERISTICS

K07

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 262.5...268.5  
1000 s: (259.5...271.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 145.0...149.0  
1000 s: (143.0...151.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 925...935

INTERMEDIATE RATED SPEED  
Rack travel in mm : 10.30  
Speed rpm : 805.0  
Rack travel in mm : 4.70  
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.40...9.60

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173-P24

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b3  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 824

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA878-4K  
 Governor no. : 0 421 815 181

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : EM6 225L 4VH

1st version kW : 165.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm<sup>3</sup>/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 900

Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 10.00  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1015...1045  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack trave: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 510  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 600  
Rack travel in m: 12.50...12.70  
4th speed rpm : 700  
Rack travel in m: 11.80...12.00  
5th speed rpm : 350  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 13.20...13.40

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 220  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 500  
Rack travel in m: 12.00...12.40

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 234.0...240.0  
1000 s: (231.0...243.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 131.0...135.0  
1000 s: (129.0...137.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 925...935

INTERMEDIATE RATED SPEED  
Rack travel in mm : 10.20  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.50...8.90

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173-P28

Delivery-valve spring pre-tension  
3.0...3.2 mm.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MAC 11,1 b6  
Edition : 02.05.90  
Replaces : 31.10.89  
Test oil : ISO-4113

Combination no. : 0 402 746 825

Injection pump  
Pump designation : PES6P120A720RS7135  
EP type number : 0 412 726 807  
Governor  
Governor design. : RQV325...900PA878-5K  
Governor no. : 0 421 815 182

Customer-spec. information  
Customer : MACK TRUCKS INC.

Engine : E C 6 350 4VH

1st version kW : 261.0  
Rated speed : 1800

### TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
(2.70...2.90)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.00...15.10

Del. quantity cm<sup>3</sup>/ : 25.0...25.2

100 s: (24.7...25.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del. quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 3.10...3.30

3rd speed rpm : 850

travel mm : 5.90...6.10

4th speed rpm : 1000

travel mm : 7.50...7.70

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 7.00...13.00

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200  
Del.quantity : 250.5...252.5  
1000 : (247.5...255.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

#### Testing:

1st rack travel in: 14.00  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 7...15

#### Testing:

Speed rpm : 275  
Minimum rack travel: 6.60  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 625  
Rack travel in m: 15.40...15.50  
3rd speed rpm : 700  
Rack travel in m: 15.30...15.40  
4th speed rpm : 500  
Rack travel in m: 0.00...15.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 15.40...15.50

#### Measurement

Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.30...8.70

2nd pressure hPa : 280  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 650  
Rack travel in m: 13.30...13.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 272.5...278.5  
1000 s: (269.5...281.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 950...960

#### INTERMEDIATE RATED SPEED

Rack travel in mm : 13.70  
Speed rpm : 850  
Rack travel in mm : 5.00  
Speed rpm : 350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
1000 s: (120.0...180.0)  
Rack travel in mm : 8.30...8.70

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MACK # 313GC5173-P16

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b4  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 826

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RGV325...875PA878-6K  
 Governor no. : 0 421 815 183

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : EM6 250L 4VH

1st version kW : 186.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del. quantity cm<sup>3</sup>/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del. quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del. quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control Lever  
position degrees: 52...60

### Testing:

1st rack travel in: 9.80  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control Lever  
position degrees: 9...17

### Testing:

Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

## CONSTANT REGULATION

Speed rpm : 325...520

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 510  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 700  
Rack travel in m: 11.60...11.80  
4th speed rpm : 550  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.20

## Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435  
Rack travel in m: 12.20...12.60

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 240.0...246.0  
1000 s: (237.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 146.0...150.0  
1000 s: (144.0...152.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 925...935

## INTERMEDIATE RATED SPEED

Rack travel in mm : 10.20  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...185.0  
1000 s: (135.0...195.0)  
Rack travel in mm : 8.60...9.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P20

Delivery-valve spring pre-tension  
3.0...3.2 mm.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 d
Edition : 02.05.90
Replaces : 31.10.89
Test oil : ISO-4113
Combination no. : 0 402 746 828
Injection pump
Pump designation : PES6P120A72ORS7148
EP type number : 0 412 726 810
Governor
Governor design. : RQV325...875PA878-7K
Governor no. : 0 421 815 184

Customer-spec. information
Customer : MACK TRUCKS INC.

Engine : EM6 300L 4VH

1st version kw : 224.0
Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 6.00...8.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40

2nd speed rpm : 450
travel mm : 2.50...2.80

3rd speed rpm : 600
travel mm : 4.10...4.30

4th speed rpm : 875
travel mm : 7.30...7.50

5th speed rpm : 1000
travel mm : 8.70...9.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 875
Aneroid pressure h: 1500
Del.quantity : 199.0...201.0
1000 : (196.0...204.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 10.10  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 510  
Rack travel in m: 16.50...16.70  
3rd speed rpm : 700  
Rack travel in m: 13.30...13.50  
4th speed rpm : 600  
Rack travel in m: 15.50...15.70  
5th speed rpm : 450  
Rack travel in m: 0.00...16.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1500  
Rack travel mm : 16.50...16.70

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 370

Rack travel in m: 10.70...10.80  
3rd pressure hPa : 710  
Rack travel in m: 14.40...14.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 299.0...305.0  
1000 s: (296.0...308.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 152.5...156.5  
1000 s: (150.5...158.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 915...925

INTERMEDIATE RATED SPEED  
Rack travel in mm : 11.30  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 8.30...8.70

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5174-P4  
Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 a7  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 829  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...1050PA848-8  
 K  
 Governor no. : 0 421 815 185

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6-270 4VH

1st version kw : 201.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.20...12.30

Del. quantity cm<sup>3</sup>/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del. quantity cm<sup>3</sup>/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.50...2.80

3rd speed rpm : 800

travel mm : 4.80...5.00

4th speed rpm : 1050

travel mm : 7.30...7.60

5th speed rpm : 1200

travel mm : 9.40...9.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1210

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 900  
Del.quantity : 174.0...176.0  
1000 : (171.0...179.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 55...63

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.40  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...600

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 630  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 925  
Rack travel in m: 11.90...12.10  
4th speed rpm : 800  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 630  
Pressure hPa : 900  
Rack travel mm : 12.00...12.10

Measurement  
Speed 1/min : 630

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 270  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 400  
Rack travel in m: 11.00...11.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 630  
Del.quantity cm<sup>3</sup>/ : 192.0...198.0  
1000 s: (189.0...201.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 129.0...133.0  
1000 s: (127.0...135.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.60...9.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 3136C5173P30

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a  
 Edition : 02.05.90  
 Replaces : 30.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 836

Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA848-12  
 K

Governer no. : 0 421 815 192

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E7 400 4VH

1st version kW : 298.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  


---

 Rack travel in mm : 15.50...15.60  


---

 Del.quantity cm<sup>3</sup>/ : 27.2...27.4  
 100 s: (26.9...27.7)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  


---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.9...5.1  
 Del.quantity cm<sup>3</sup>/ : 4.3...4.9  
 100 s: (4.1...5.1)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 325  
 travel mm : 1.30...1.60  
 2nd speed rpm : 500  
 travel mm : 3.40...4.00  
 3rd speed rpm : 900  
 travel mm : 6.70...6.90  
 4th speed rpm : 1075  
 travel mm : 8.40...8.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del.quantity : 272.0...274.0  
 1000 : (269.0...277.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 14.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...500

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.50...15.60  
2nd speed rpm : 625  
Rack travel in m: 15.30...15.50  
3rd speed rpm : 500  
Rack travel in m: 0.00...14.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 15.50...15.60

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 225  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 770  
Rack travel in m: 13.80...14.20

START CUT-OUT

Speed 1/min : 280 (290)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 309.0...315.0  
1000 s: (306.0...318.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 166.0...170.0  
1000 s: (164.0...172.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.50  
Speed rpm : 940...950

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.90...10.30

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 43.0...49.0  
1000 s: (41.0...51.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5179-P18

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a1  
 Edition : 02.05.90  
 Replaces : 30.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 837

Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA848-15  
 K

Governer no. : 0 421 815 193

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E7 350 4VH

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

K20

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  


---

 Rack travel in mm : 14.00...14.10  


---

 Del.quantity cm<sup>3</sup>/ : 22.8...23.0  
 100 s: (22.5...23.3)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)  


---

2nd speed rpm : 325.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm<sup>3</sup>/ : 4.1...4.7  
 100 s: (3.9...4.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.30...1.60  
 2nd speed rpm : 500  
 travel mm : 3.40...4.00  
 3rd speed rpm : 900  
 travel mm : 6.70...6.90  
 4th speed rpm : 1075  
 travel mm : 8.40...8.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 900  
 Del.quantity : 228.0...230.0  
 1000 : (225.0...233.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 13.00  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1100...1130  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.90  
Speed rpm : 325  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 325...500

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 625  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 500  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 900  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.80...9.20  
2nd pressure hPa : 225  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 545  
Rack travel in m: 12.70...13.10

START CUT-OUT

Speed 1/min : 265 (275)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 260.0...266.0  
1000 s: (257.0...269.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 166.0...170.0  
1000 s: (164.0...172.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 950...960

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 10.40...10.80

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5179-P2



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a7  
 Edition : 02.05.90  
 Replaces : 30.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 838

Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...875PA848-14  
 K  
 Governor no. : 0 421 815 194

Customer-spec. information  
 Customer : MACK

Engine : EM7-250L 4VH

1st version kW : 187.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

K22

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

---

Rack travel in mm : 10.40...10.50

---

Del.quantity cm<sup>3</sup>/ : 17.4...17.6  
 100 s: (17.1...17.9)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...4.9  
 Del.quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.8...4.8)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.30...1.60  
 2nd speed rpm : 500  
 travel mm : 3.40...4.00  
 3rd speed rpm : 900  
 travel mm : 6.70...6.90  
 4th speed rpm : 1075  
 travel mm : 8.40...8.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 900  
 Del.quantity : 174.0...176.0  
 1000 : (171.0...179.0)

---

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 9.40  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1020...1050  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 12...20

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 510  
Rack travel in m: 11.90...12.10  
3rd speed rpm : 450  
Rack travel in m: 0.00...11.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 11.90...12.10

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 235  
Rack travel in m: 8.80...8.90  
3rd pressure hPa : 485  
Rack travel in m: 10.80...11.20

START CUT-OUT

Speed 1/min : 275 (285)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 244.0...250.0  
1000 s: (241.0...253.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 151.0...155.0  
1000 s: (149.0...157.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 915...925

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 10.10...10.30

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:  
: MACK # 313GC5179-P26

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 b  
 Edition : 02.05.90  
 Replaces : 30.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 839

Injection pump  
 Pump designation : PES6P120A72ORS7148  
 EP type number : 0 412 726 810  
 Governor  
 Governor design. : RQV325...875PA848-19  
 K  
 Governor no. : 0 421 815 199

Customer-spec. information  
 Customer : MACK

Engine : EM7 300L 4VH

1st version kW : 224.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 6.00...8.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

---

Rack travel in mm : 11.50...11.60

---

Del.quantity cm<sup>3</sup>/ : 21.0...21.2  
 100 s: (20.7...21.5)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.5...4.7  
 Del.quantity cm<sup>3</sup>/ : 4.1...4.7  
 100 s: (3.9...4.9)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.50...2.80  
 3rd speed rpm : 600  
 travel mm : 4.10...4.30  
 4th speed rpm : 875  
 travel mm : 7.30...7.50  
 5th speed rpm : 1000  
 travel mm : 8.70...9.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del.quantity : 210.0...212.0  
 1000 : (207.0...215.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 10.50  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 510  
Rack travel in m: 16.00...16.20  
3rd speed rpm : 800  
Rack travel in m: 12.00...12.20  
4th speed rpm : 600  
Rack travel in m: 15.10...15.30  
5th speed rpm : 450  
Rack travel in m: 0.00...15.70

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 16.00...16.20

#### Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 325

K25

Rack travel in m: 10.60...10.70  
3rd pressure hPa : 815  
Rack travel in m: 14.30...14.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 294.0...300.0  
1000 s: (291.0...303.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 166.0...170.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 165.0...185.0  
1000 s: (155.0...195.0)  
Rack travel in mm : 8.70...9.10

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5179-P6

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1a12  
 Edition : 02.05.90  
 Replaces : 30.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 840  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-18  
 K  
 Governor no. : 0 421 815 198

Customer-spec. information  
 Customer : MACK

Engine : EMC6 250L 4VH

1st version kW : 187.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. l/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.20...11.30

Del. quantity cm<sup>3</sup>/ : 17.3...17.5

100 s: (17.0...17.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del. quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40

2nd speed rpm : 450  
travel mm : 2.80...3.20

3rd speed rpm : 850  
travel mm : 6.20...6.40

4th speed rpm : 1000  
travel mm : 7.70...7.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del. quantity : 173.0...175.0

1000 : (170.0...178.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever position degrees: 54...62

Testing:

1st rack travel in: 10.20
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1010...1040
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever position degrees: 9...17

Testing:

Speed rpm : 275
Minimum rack travel: 1.50
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.20...11.30
2nd speed rpm : 510
Rack travel in m: 13.10...13.30
3rd speed rpm : 700
Rack travel in m: 12.00...12.20
4th speed rpm : 450
Rack travel in m: 0.00...13.10

Aneroid/Altitude Compensator Test

1st version

Setting -
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.10...13.30

Measurement

Speed 1/min : 510
1st pressure hPa : -
Rack travel in m: 9.10...9.50
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40
3rd pressure hPa : 435
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 239.0...245.0
1000 s: (236.0...248.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 146.0...150.0
1000 s: (144.0...152.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 10.20
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (150.0...210.0)
Rack travel in mm : 9.10...9.50

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P32

Delivery-valve spring pre-tension 3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 e  
 Edition : 24.01.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 842

Injection pump  
 Pump designation : PES6P120A72ORS7164  
 EP type number : 0 412 726 816  
 Governor  
 Governor design. : RQV325...875PA848-17  
 K

Governer no. : 0 421 815 200

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EMC6 300L 4VH

1st version kW : 200.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 12.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875  


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 Rack travel in mm : 14.90...15.00  


---

 Del.quantity cm<sup>3</sup>/ : 22.5...22.7  
 100 s: (22.3...22.9)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)  


---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.6...4.8  
 Del.quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s: (3.7...4.7)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.00...3.40  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.40...7.70

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1120  
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200

Del.quantity : 225.0...227.0  
1000 : (223.0...229.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 13.90  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1160  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.20  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 14.90...15.00  
2nd speed rpm : 510  
Rack travel in m: 16.90...17.10  
3rd speed rpm : 700  
Rack travel in m: 15.70...15.90  
4th speed rpm : 600  
Rack travel in m: 16.60...16.80  
5th speed rpm : 420  
Rack travel in m: 0.00...16.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 16.90...17.10

Measurement  
Speed 1/min : 510

1st pressure hPa : -

L01

Rack travel in m: 10.90...11.30  
2nd pressure hPa : 375  
Rack travel in m: 12.70...12.80  
3rd pressure hPa : 735  
Rack travel in m: 15.70...16.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 309.0...315.0  
1000 s: (306.0...318.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 156.0...160.0  
1000 s: (154.0...162.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 10.80...11.20

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5181P14

Delivery-valve spring pre-tension  
3.0...3.2 mm.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a15  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 846

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA848-23  
 K  
 Governor no. : 0 421 815 204

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kW : 224.0  
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.0...202.0

1000 : (197.0...205.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 50...58

Testing:

1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:

Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.60...13.70  
3rd speed rpm : 600  
Rack travel in m: 13.80...13.90  
4th speed rpm : 500  
Rack travel in m: 0.00...13.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 250  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 475  
Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 237.0...243.0  
1000 s: (234.0...246.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 10.30...10.50

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5184-P6

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a16  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 847

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA878-8K  
 Governor no. : 0 421 815 205

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kW : 224.0  
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

---

Rack travel in mm : 12.90...13.00

---

Del.quantity cm<sup>3</sup>/ : 20.0...20.2  
 100 s: (19.7...20.5)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.5...4.7  
 Del.quantity cm<sup>3</sup>/ : 3.2...3.8  
 100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 900  
 Del.quantity : 200.0...202.0  
 1000 : (197.0...205.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:  
1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

## CONSTANT REGULATION

Speed rpm : 325...520

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.60...13.70  
3rd speed rpm : 600  
Rack travel in m: 13.80...13.90  
4th speed rpm : 500  
Rack travel in m: 0.00...13.60

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

## Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 250  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 475  
Rack travel in m: 12.90...13.30

## FUEL DELIVERY CHARACTERISTICS

LOS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 237.0...243.0  
1000 s: (234.0...246.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 900...910

## INTERMEDIATE RATED SPEED

Rack travel in mm : 12.20  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 10.30...10.50

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5184-P8

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a17  
 Edition : 02.05.90  
 Replaces : 31.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 848

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA878-9K  
 Governor no. : 0 421 815 206

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E6-350

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.80...14.90

Del.quantity cm<sup>3</sup>/ : 24.8...25.0  
 100 s: (24.5...25.3)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.9...5.1  
 Del.quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s: (3.7...4.7)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.10...3.30  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del.quantity : 248.5...250.5  
 1000 : (245.5...253.5)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 13.80  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.60  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 625  
Rack travel in m: 15.20...15.30  
3rd speed rpm : 700  
Rack travel in m: 15.00...15.10  
4th speed rpm : 500  
Rack travel in m: 0.00...14.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 15.20...15.30

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 310  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 710  
Rack travel in m: 13.70...14.10

FUEL DELIVERY CHARACTERISTICS

L07

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 271.0...277.0  
1000 s: (268.0...280.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 130.5...134.5  
1000 s: (128.5...136.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 950...960

INTERMEDIATE RATED SPEED  
Rack travel in mm : 14.00  
Speed rpm : 850  
Rack travel in mm : 5.00  
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (120.0...180.0)  
Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5184-P12

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a18  
 Edition : 02.05.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 849  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA878-10  
 K  
 Governor no. : 0 421 815 209

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 275 4VH

1st version kW : 202.0  
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19  
 Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850  
 Rack travel in mm : 11.90...12.00  
 Del. quantity cm<sup>3</sup>/ : 18.3...18.5  
 100 s: (18.0...18.8)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.5...4.7  
 Del. quantity cm<sup>3</sup>/ : 3.2...3.8  
 100 s: (3.0...4.0)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.10  
 3rd speed rpm : 850  
 travel mm : 6.20...6.40  
 4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 900  
 Del. quantity : 183.0...185.0  
 1000 : (180.0...188.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 50...58

Testing:

1st rack travel in: 10.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:

Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

## CONSTANT REGULATION

Speed rpm : 325...520

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 11.90...12.90  
2nd speed rpm : 700  
Rack travel in m: 12.80...12.90  
3rd speed rpm : 600  
Rack travel in m: 13.00...13.10  
4th speed rpm : 500  
Rack travel in m: 0.00...12.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.00...13.10

Measurement

Speed 1/min : 600  
1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 225  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 385  
Rack travel in m: 12.20...12.60

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 219.5...225.5  
1000 s: (216.5...228.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

## BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 10.90  
Speed rpm : 900...910

## INTERMEDIATE RATED SPEED

Rack travel in mm : 11.30  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 10.30...10.50

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5184-P4

Delivery-valve spring pre-tension  
3.0...3.2 mm.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a13  
 Edition : 02.05.90  
 Replaces : 15.12.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 850

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848-24  
 K  
 Governor no. : 0 421 815 207

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E6-350

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.80...14.90

Del. quantity cm<sup>3</sup>/ : 24.8...25.0

100 s: (24.5...25.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del. quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.10...3.30

3rd speed rpm : 850  
 travel mm : 5.90...6.10

4th speed rpm : 1000  
 travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del. quantity : 248.5...250.5

1000 : (245.5...253.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 56...64

Testing:

1st rack travel in: 13.80  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:

Speed rpm : 275  
Minimum rack travel: 6.60  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 625  
Rack travel in m: 15.20...15.30  
3rd speed rpm : 700  
Rack travel in m: 15.00...15.10  
4th speed rpm : 500  
Rack travel in m: 0.00...14.90

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 15.20...15.30

Measurement

Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 310  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 710  
Rack travel in m: 13.70...14.10

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 271.0...277.0  
1000 s: (268.0...280.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.80  
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
1000 s: (120.0...180.0)  
Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5184-P10

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a14
Edition : 02.05.90
Replaces : 31.10.89
Test oil : ISO-4113
Combination no. : 0 402 746 851
Injection pump
Pump designation : PES6P120A720RS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...850PA848-25
K
Governor no. : 0 421 815 208

Customer-spec. information
Customer : MACK TRUCKS

Engine : E6 275 4VH

1st version kW : 202.0
Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850
Rack travel in mm : 11.90...12.00
Del.quantity cm3/ : 18.3...18.5
100 s: (18.0...18.8)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.4...4.6
Del.quantity cm3/ : 3.2...3.8
100 s: (3.0...4.0)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40
2nd speed rpm : 450
travel mm : 2.80...3.10
3rd speed rpm : 850
travel mm : 6.20...6.40
4th speed rpm : 1000
travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 850
Aneroid pressure h: 900
Del.quantity : 183.0...185.0
1000 : (180.0...188.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:

1st rack travel in: 10.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1020...1050  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.40...4.60

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 11.90...12.00  
2nd speed rpm : 700  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 600  
Rack travel in m: 12.90...13.10  
4th speed rpm : 500  
Rack travel in m: 0.00...12.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.00...13.10

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 225  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 385  
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 219.5...225.5  
1000 s: (216.5...228.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 10.90  
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.40...4.60  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5184-P2

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a3  
 Edition : 02.05.90  
 Replaces : 2.1.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 852  
 Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA909K  
 Governor no. : 0 421 815 210

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-400

1st version kw : 298.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  


---

 Rack travel in mm : 15.80...15.90  


---

 Del.quantity cm<sup>3</sup>/ : 27.5...27.7  
 100 s: (27.2...28.0)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)  


---

2nd speed rpm : 325.0  
 Rack travel in mm : 5.1...5.3  
 Del.quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.8...4.8)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 650  
 travel mm : 5.60...5.80  
 4th speed rpm : 900  
 travel mm : 8.30...8.50  
 5th speed rpm : 1100  
 travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del.quantity : 275.0...277.0  
 1000 : (272.0...280.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 14.80  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.80...15.90  
2nd speed rpm : 625  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 700  
Rack travel in m: 15.40...15.60  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 15.80...15.90

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 325  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 790  
Rack travel in m: 13.80...14.20

START CUT-OUT

Speed 1/min : 275 (285)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del. quantity cm<sup>3</sup>/ : 302.5...308.5  
1000 s: (299.5...311.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 157.5...161.5  
1000 s: (155.5...163.5)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.80  
Speed rpm : 940...950

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 180.0...220.0  
1000 s: (170.0...230.0)  
Rack travel in mm : 10.80...11.40

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.10...5.30  
Del. quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5185-P6

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a4  
 Edition : 02.05.90  
 Replaces : 15.12.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 853  
 Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA909-1K  
 Governor no. : 0 421 815 211

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 23.1...23.3

100 s: (22.9...23.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 650  
 travel mm : 5.60...5.80

4th speed rpm : 900  
 travel mm : 8.30...8.50

5th speed rpm : 1100  
 travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 231.5...233.5

1000 : (229.5...235.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 12.60  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack trave: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 625  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 500  
Rack travel in m: 0.00...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.60...13.70

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 325  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 685  
Rack travel in m: 12.10...12.50

START CUT-OUT

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 263.0...269.0  
1000 s: (260.0...272.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 153.0...157.0  
1000 s: (151.0...159.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 10.30...10.90

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5185-P2



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 9,5 a 1  
 Edition : 08.06.90  
 Replaces : 15.12.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 857

Injection pump  
 Pump designation : PES6P120A72ORS7177  
 EP type number : 0 412 726 823  
 Governor  
 Governor design. : RQ275/1100PA915  
 Governor no. : 0 421 801 478

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8460.41.601

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

---

Rack travel in mm : 12.30...12.40

---

Del.quantity cm<sup>3</sup>/ : 18.3...18.5

---

100 s: (18.0...18.8)

---

Spread cm<sup>3</sup> : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 275.0  
 Rack travel in mm : 5.7...5.9  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2

Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 900  
 Del.quantity : 183.0...185.0  
 1000 : (180.0...188.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version

Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.30  
 Speed rpm : 1145...1160

2nd rack travel in: 4.00  
 Speed rpm : 1230...1260

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.8

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.30  
Speed rpm : 275  
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION  
Speed rpm : 330...370

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 320  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 260  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...155.0  
1000 s: (121.0...159.0)

Remarks: :

#### APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 12,0 d 3  
 Edition : 12.04.90  
 Replaces : 2.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 860  
 Injection pump  
 Pump designation : PES6P120A720LS7161  
 EP type number : 0 412 726 817  
 Governor  
 Governor design. : RQV300..1050PA940-3  
 Govenner no. : 0 421 813 827

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 A

1st version kW : 213.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm<sup>3</sup>/ : 20.1...20.3  
 100 s: (19.8...20.6)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.7  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.30  
 2nd speed rpm : 600  
 travel mm : 4.90...5.10  
 3rd speed rpm : 800  
 travel mm : 5.90...6.20  
 4th speed rpm : 1100  
 travel mm : 8.10...8.50  
 5th speed rpm : 1175  
 travel mm : 9.70...10.20

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1085  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 681  
Del. quantity : 201.0...203.0  
1000 : (198.0...206.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.60  
Speed rpm : 300  
Rack travel in mm : 6.30...6.70

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 1.20  
2nd speed rpm : 1050  
Rack travel in m: 13.50...13.70  
3rd speed rpm : 750  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 680  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.40...12.60  
2nd pressure hPa : 400  
Rack travel in m: 13.10...13.30  
3rd pressure hPa : 800

Rack travel in m: 14.20...14.30 \*  
4th pressure hPa : -  
Rack travel in m: 11.30...11.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 193.0...195.0  
1000 s: (190.0...198.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 218.0...222.0  
1000 s: (215.0...225.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 12.50  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 170.0...190.0  
1000 s: (166.0...194.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 f1  
 Edition : 02.05.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 746 861

Injection pump  
 Pump designation : PES6P120A72ORS7183  
 EP type number : 0 412 726 825  
 Governor  
 Governor design. : RQV325...875PA848-26  
 K  
 Governor no. : 0 421 815 212

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM 6-300L

1st version kW : 183.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 6.00...8.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.20...11.30

Del. quantity cm<sup>3</sup>/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del. quantity cm<sup>3</sup>/ : 4.1...4.7

100 s: (3.9...4.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.50...2.80

3rd speed rpm : 600

travel mm : 4.10...4.30

4th speed rpm : 875

travel mm : 6.90...7.10

5th speed rpm : 1000

travel mm : 8.20...8.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1500

Del. quantity : 209.0...211.0

1000 : (206.0...214.0)

Spread cm3 : 5.00 —  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 10.20  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 510  
Rack travel in m: 16.60...16.80  
3rd speed rpm : 700  
Rack travel in m: 13.20...13.40  
4th speed rpm : 600  
Rack travel in m: 15.20...15.60  
5th speed rpm : 420  
Rack travel in m: 0.00...16.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1500  
Rack travel mm : 16.60...16.80

Measurement  
Speed 1/min : 510

1st pressure hPa : —  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 435

Rack travel in m: 10.80...11.00  
3rd pressure hPa : 795  
Rack travel in m: 14.60...15.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 510  
Del. quantity cm3/ : 308.0...314.0  
1000 s: (305.0...317.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: —  
Speed rpm : 400  
Del. quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 8.70...9.10

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del. quantity cm3/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5174-P6

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 f  
 Edition : 02.05.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 862  
 Injection pump  
 Pump designation : PES6P120A72ORS7183  
 EP type number : 0 412 726 825  
 Governor  
 Governor design. : RQV325...875PA878-11  
 K  
 Governor no. : 0 421 815 213

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM 6-300L

1st version kW : 183.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 6.00...8.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.20...11.30

Del.quantity cm<sup>3</sup>/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm<sup>3</sup>/ : 4.1...4.7

100 s: (3.9...4.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.50...2.80

3rd speed rpm : 600  
 travel mm : 4.10...4.30

4th speed rpm : 875  
 travel mm : 7.30...7.50

5th speed rpm : 1000  
 travel mm : 8.70...9.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1500

Del.quantity : 209.0...211.0

1000 : (206.0...214.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 10.20  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 510  
Rack travel in m: 16.60...16.80  
3rd speed rpm : 700  
Rack travel in m: 13.30...13.50  
4th speed rpm : 600  
Rack travel in m: 15.50...15.70  
5th speed rpm : 450  
Rack travel in m: 0.00...16.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1500  
Rack travel mm : 16.60...16.80

#### Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 435

Rack travel in m: 10.80...11.00  
3rd pressure hPa : 795  
Rack travel in m: 14.60...15.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1500  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 308.0...314.0  
1000 s: (305.0...317.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 915...925

#### INTERMEDIATE RATED SPEED

Rack travel in mm : 11.20  
Speed rpm : 805  
Rack travel in mm : 4.70  
Speed rpm : 300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 165.0...205.0  
1000 s: (160.0...210.0)  
Rack travel in mm : 8.70...9.10

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5174-P8

Delivery-valve spring pre-tension  
3.0...3.2 mm.



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MAC 11,1 e1  
 Edition : 02.05.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 864  
 Injection pump  
 Pump designation : PES6P120A72ORS7164  
 EP type number : 0 412 726 816  
 Governor  
 Governor design. : RQV325...900PA878-12  
 K  
 Governor no. : 0 421 815 215

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EC6-350 4VH

1st version kw : 261.0  
 Rated speed : 1800

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 12.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 16.00...16.10

Del. quantity cm<sup>3</sup>/ : 25.5...25.7

100 s: (25.2...26.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.3...4.5

Del. quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.00...3.40

3rd speed rpm : 850  
 travel mm : 5.90...6.10

4th speed rpm : 1000  
 travel mm : 7.40...7.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del. quantity : 255.5...257.5

1000 : (252.5...260.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 15.00  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 16.00...16.10  
2nd speed rpm : 625  
Rack travel in m: 16.50...16.70  
3rd speed rpm : 550  
Rack travel in m: 0.00...16.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 16.50...16.70

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 9.40...9.80  
2nd pressure hPa : 265  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 665  
Rack travel in m: 14.70...15.10

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 280.0...286.0  
1000 s: (277.0...289.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 141.5...145.5  
1000 s: (139.5...147.5)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 15.00  
Speed rpm : 950...960

INTERMEDIATE RATED SPEED  
Rack travel in mm : 13.70  
Speed rpm : 850  
Rack travel in mm : 5.00  
Speed rpm : 300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 9.40...9.80

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.30...4.50  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5181P12

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 e2  
 Edition : 02.05.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 865

Injection pump  
 Pump designation : PES6P120A72ORS7164  
 EP type number : 0 412 726 816  
 Governor  
 Governor design. : RQV325...875PA878-13  
 K  
 Governor no. : 0 421 815 216

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM6-275L 4VH

1st version kw : 205.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 12.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

---

Rack travel in mm : 13.60...13.70

---

Del.quantity cm<sup>3</sup>/ : 19.3...19.5  
 100 s: (19.1...19.7)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...5.1  
 Del.quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s: (3.7...4.7)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del.quantity : 193.5...195.5  
 1000 : (191.5...197.5)

---

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 12.60  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.20  
Speed rpm : 325  
Rack travel in mm : 4.70...5.10

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 510  
Rack travel in m: 15.40...15.60  
3rd speed rpm : 750  
Rack travel in m: 13.90...14.20  
4th speed rpm : 600  
Rack travel in m: 15.10...15.30  
5th speed rpm : 420  
Rack travel in m: 0.00...15.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 15.40...15.60

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 10.70...11.10  
2nd pressure hPa : 265  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 450

Rack travel in m: 14.20...14.60

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 261.0...267.0  
1000 s: (259.0...269.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 152.0...156.0  
1000 s: (150.0...158.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 915...925

INTERMEDIATE RATED SPEED  
Rack travel in mm : 12.70  
Speed rpm : 805  
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 185.0...225.0  
1000 s: (175.0...235.0)  
Rack travel in mm : 10.70...11.10

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...5.10  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5181P8

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 a5  
 Edition : 24.02.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 866

Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...875PA909-2K  
 Governor no. : 0 421 815 217

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-300L

1st version kW : 224.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.60...12.70

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

100 s: (20.9...21.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 650

travel mm : 5.60...5.80

4th speed rpm : 900

travel mm : 8.30...8.50

5th speed rpm : 1100

travel mm : 10.30...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 211.0...213.0

1000 : (209.0...215.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 11.60  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 510  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 400  
Rack travel in m: 0.00...13.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.60...13.70

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 370  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 740  
Rack travel in m: 12.30...12.70

START CUT-OUT

Speed 1/min : 275 (285)

M03

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 292.5...296.5  
1000 s: (289.5...299.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 157.5...161.5  
1000 s: (155.5...163.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...220.0  
1000 s: (170.0...230.0)  
Rack travel in mm : 10.40...11.00

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5185-P10

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 e4  
 Edition : 08.06.90  
 Replaces : 2.1.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 867

Injection pump  
 Pump designation : PES6P120A72ORS7164  
 EP type number : 0 412 726 816  
 Governor  
 Governor design. : RQV325...900PA848-27  
 K  
 Governor no. : 0 421 815 218

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EC6-350 4VH

1st version kw : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 12.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

---

Rack travel in mm : 16.00...16.10

---

Del.quantity cm<sup>3</sup>/ : 25.5...25.7  
 100 s: (25.2...26.0)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.3...4.5  
 Del.quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.00...3.40

3rd speed rpm : 850  
 travel mm : 5.90...6.10

4th speed rpm : 1000  
 travel mm : 7.40...7.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del.quantity : 255.5...257.5  
 1000 : (252.5...260.5)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 15.00  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1095...1125  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 16.00...16.10  
2nd speed rpm : 625  
Rack travel in m: 16.50...16.70  
3rd speed rpm : 550  
Rack travel in m: 0.00...16.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 16.50...16.70

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 9.40...9.80  
2nd pressure hPa : 265  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 665  
Rack travel in m: 14.70...15.10

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 280.0...286.0  
1000 s: (277.0...289.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 141.5...145.5  
1000 s: (139.5...147.5)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 15.00  
Speed rpm : 950...960

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 9.40...9.80

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.30...4.50  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: MACK # 313GC5181P10

Delivery-valve spring pre-tension  
3.0...3.2 mm.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1 e5  
 Edition : 02.05.90  
 Replaces : 9.3.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 868

Injection pump  
 Pump designation : PES6P120A72ORS7164  
 EP type number : 0 412 726 816  
 Governor  
 Governor design. : RQV325...875PA848-28  
 K  
 Governor no. : 0 421 815 219

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM6-275L 4VH

1st version kW : 205.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 12.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 19.3...19.5

100 s: (19.1...19.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...5.1

Del.quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 193.5...195.5

1000 : (191.5...197.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control Lever  
position degrees: 57...65

Testing:  
1st rack travel in: 12.60  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.20  
Speed rpm : 325  
Rack travel in mm : 4.70...5.10

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 510  
Rack travel in m: 15.40...15.60  
3rd speed rpm : 750  
Rack travel in m: 13.90...14.20  
4th speed rpm : 600  
Rack travel in m: 15.10...15.30  
5th speed rpm : 420  
Rack travel in m: 0.00...15.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 15.40...15.60

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 10.70...11.10  
2nd pressure hPa : 265  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 450

M07

Rack travel in m: 14.20...14.60

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 261.0...267.0  
1000 s: (259.0...269.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 875  
Del.quantity cm3/ : 179.0...181.0 \*  
1000 s: (151.0...173.5)  
Speed rpm : 400  
Del.quantity cm3/ : 152.0...156.0  
1000 s: (150.0...158.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 915...925

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 185.0...225.0  
1000 s: (175.0...235.0)  
Rack travel in mm : 10.70...11.10

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...5.10  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5181P6

Delivery-valve spring pre-tension  
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 1; 1 e6  
 Edition : 02.05.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 746 869  
  
 Injection pump  
 Pump designation : PES6P120A72ORS7164  
 EP type number : 0 412 726 816  
 Governor  
 Governor design. : RQV325...875PA848-29  
 K  
 Governor no. : 0 421 815 220  
  
 Customer-spec. information  
 Customer : MACK TRUCKS  
  
 Engine : EMC6 250L 4VH  
  
 1st version kw : 196.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve : 2 417 413 011  
  
 Inlet press., bar : 1.50  
  
 Overflow  
 quantity min. 1/h: 160...170  
  
 Test nozzle holder  
 assembly : 1 688 901 101  
  
 Opening  
 pressure, bar : 207...210  
  
 Orifice plate  
 diameter mm : 0,6  
  
 Test lines : 1 680 750 008  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19  
  
 Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 12.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4  
  
 Phasing : 0-60-120-180-240-300  
  
 Tolerance + - ° : 0.50 (0.75)  
  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875  


---

 Rack travel in mm : 13.00...13.10  


---

 Del.quantity cm<sup>3</sup>/ : 18.4...18.6  
 100 s: (18.2...18.8)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)  


---

 2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...4.9  
 Del.quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s: (3.7...4.7)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 850  
 travel mm : 6.20...6.40  
 4th speed rpm : 1000  
 travel mm : 7.70...7.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 900  
 Del.quantity : 184.0...186.0  
 1000 : (182.0...188.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 55...63

### Testing:

1st rack travel in: 12.00  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1035...1065  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 10...18

### Testing:

Speed rpm : 275  
Minimum rack travel: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

## CONSTANT REGULATION

Speed rpm : 325...520

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 510  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 650  
Rack travel in m: 13.90...14.20  
4th speed rpm : 450  
Rack travel in m: 0.00...14.70

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 14.90...15.10

## Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 10.40...10.80  
2nd pressure hPa : 205  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 460  
Rack travel in m: 13.90...14.30

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 252.0...258.0  
1000 s: (250.0...260.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 152.0...156.0  
1000 s: (150.0...158.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 12.00  
Speed rpm : 915...925

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 10.40...10.80

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

## Remarks:

: MACK # 313GC5181P4

Delivery-valve spring pre-tension  
3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a6  
 Edition : 02.05.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 870

Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...875PA878-14  
 K

Governer no. : 0 421 815 222

Customer-spec. information  
 Customer : MACK

Engine : EM7-250L 4VH

1st version kW : 187.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

M10

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.30...1.60

2nd speed rpm : 500

travel mm : 3.40...4.00

3rd speed rpm : 900

travel mm : 6.70...6.90

4th speed rpm : 1075

travel mm : 8.40...8.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 900

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 9.40  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1020...1050  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 12...20

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 510  
Rack travel in m: 11.90...12.10  
3rd speed rpm : 450  
Rack travel in m: 0.00...11.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 11.90...12.10

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 235  
Rack travel in m: 8.80...8.90  
3rd pressure hPa : 485  
Rack travel in m: 10.80...11.20

START CUT-OUT

Speed 1/min : 275 (285)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 244.0...250.0  
1000 s: (241.0...253.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 151.0...155.0  
1000 s: (149.0...157.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 915...925

INTERMEDIATE RATED SPEED  
Rack travel in mm : 9.80  
Speed rpm : 805

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 10.10...10.30

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5179-P28

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 c  
 Edition : 02.05.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 871

Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA929K  
 Governor no. : 0 421 815 223

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-400

1st version kW : 298.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.80...15.90

Del.quantity cm<sup>3</sup>/ : 27.5...27.7

100 s: (27.2...28.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 5.1...5.3

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 650

travel mm : 5.60...5.80

4th speed rpm : 900

travel mm : 8.30...8.50

5th speed rpm : 1100

travel mm : 10.30...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 275.0...277.0

1000 : (272.0...280.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 14.80  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.80...15.90  
2nd speed rpm : 625  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 700  
Rack travel in m: 15.40...15.60  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 15.80...15.90

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 325  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 790  
Rack travel in m: 13.80...14.20

START CUT-OUT

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 302.5...308.5  
1000 s: (299.5...311.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 157.5...161.5  
1000 s: (155.5...163.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.80  
Speed rpm : 940...950

INTERMEDIATE RATED SPEED  
Rack travel in mm : 14.70  
Speed rpm : 850.0

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...220.0  
1000 s: (170.0...230.0)  
Rack travel in mm : 10.80...11.40

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.10...5.30  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5185-P8



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 c1  
 Edition : 02.05.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 872  
 Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA929-1K  
 Governor no. : 0 421 815 224

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 23.1...23.3

100 s: (22.9...23.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 650

travel mm : 5.60...5.80

4th speed rpm : 900

travel mm : 8.30...8.50

5th speed rpm : 1100

travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 231.5...233.5

1000 : (229.5...235.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 12.60  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 625  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 500  
Rack travel in m: 0.00...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.60...13.70

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 325  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 685  
Rack travel in m: 12.10...12.50

START CUT-OUT

Speed 1/min : 275 (285)

M15

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 263.0...269.0  
1000 s: (260.0...272.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 153.0...157.0  
1000 s: (151.0...159.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.60  
Speed rpm : 940...950

INTERMEDIATE RATED SPEED  
Rack travel in mm : 12.70  
Speed rpm : 850

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 10.30...10.90

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5185-P4

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 c2  
 Edition : 02.05.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 873

Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...875PA929-2K  
 Governor no. : 0 421 815 225

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-300L

1st version kW : 224.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.60...12.70

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

100 s: (20.9...21.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.8...5.0  
 Del.quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 650  
 travel mm : 5.60...5.80

4th speed rpm : 900  
 travel mm : 8.30...8.50

5th speed rpm : 1100  
 travel mm : 10.30...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 211.0...213.0

1000 : (209.5...215.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 11.60  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 510  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 400  
Rack travel in m: 0.00...13.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.60...13.80

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 370  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 740  
Rack travel in m: 12.30...12.70

START CUT-OUT

Speed 1/min : 275 (285)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del. quantity cm<sup>3</sup>/ : 292.5...296.5  
1000 s: (189.5...199.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 157.5...161.5  
1000 s: (155.5...163.5)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 915...925

INTERMEDIATE RATED SPEED  
Rack travel in mm : 11.90  
Speed rpm : 805

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 180.0...220.0  
1000 s: (170.0...230.0)  
Rack travel in mm : 10.40...11.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del. quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5185-P12

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a7  
 Edition : 02.05.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 874  
 Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...850PA909-3K  
 Governor no. : 0 421 815 230

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-300

1st version kW : 220.0  
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 20.4...20.6

100 s: (20.2...20.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 650

travel mm : 5.60...5.80

4th speed rpm : 900

travel mm : 8.30...8.50

5th speed rpm : 1100

travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850

Aneroid pressure h: 1200

Del.quantity : 204.0...206.0

1000 : (202.0...208.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 11.20  
Speed rpm : 890...900  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 5...13

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 600  
Rack travel in m: 12.40...12.60  
3rd speed rpm : 500  
Rack travel in m: 0.00...11.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1200  
Rack travel mm : 12.40...12.60

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 265  
Rack travel in m: 9.00...9.10  
3rd pressure hPa : 565  
Rack travel in m: 11.20...11.60

## START CUT-OUT

Speed 1/min : 275 (285)

M19

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 241.0...247.0  
1000 s: (239.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 148.0...152.0  
1000 s: (146.0...154.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 890...900

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...220.0  
1000 s: (170.0...230.0)  
Rack travel in mm : 10.00...10.60

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

## Remarks:

: MACK # 313GC5185-P14

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a8
Edition : 02.05.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 746 875
Injection pump
Pump designation : PES6P120A72ORS7157
EP type number : 0 412 726 814
Governor
Governor design. : RQV325...975PA909-4K
Governor no. : 0 421 815 231

Customer-spec. information
Customer : MACK TRUCKS

Engine : E7-300A

1st version kW : 224.0
Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 17...19

M20

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975
Rack travel in mm : 12.30...12.40
Del.quantity cm3/ : 20.1...20.3
100 s: (19.9...20.5)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.7...4.9
Del.quantity cm3/ : 4.0...4.6
100 s: (3.8...4.8)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275
travel mm : 0.50...1.00
2nd speed rpm : 325
travel mm : 1.50...1.70
3rd speed rpm : 450
travel mm : 2.90...3.30
4th speed rpm : 1000
travel mm : 8.40...8.60
5th speed rpm : 1200
travel mm : 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 975
Aneroid pressure h: 1200
Del.quantity : 201.0...203.0
1000 : (199.0...205.0)
Spread cm3 : 5.00
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 600  
Rack travel in m: 11.70...11.90  
3rd speed rpm : 500  
Rack travel in m: 0.00...11.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 975  
Pressure hPa : 1200  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 975

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 235  
Rack travel in m: 9.00...9.10  
3rd pressure hPa : 460  
Rack travel in m: 10.80...11.20

## START CUT-OUT

Speed 1/min : 275 (285)

M21

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 221.0...227.0  
1000 s: (219.0...229.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 146.0...150.0  
1000 s: (144.0...152.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1015...1025

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...220.0  
1000 s: (170.0...230.0)  
Rack travel in mm : 10.00...10.60

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5185-P18



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 c3  
 Edition : 02.05.90  
 Replaces : 28.9.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 876

Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...850PA929-3K  
 Governor no. : 0 421 815 232

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-300 4VH

1st version kW : 220.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow quantity min. 1/h: 160...170

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant. per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

---

Rack travel in mm : 12.20...12.30

---

Del.quantity cm<sup>3</sup>/ : 20.4...20.6  
 100 s: (20.2...20.8)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...4.9  
 Del.quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.20  
 3rd speed rpm : 650  
 travel mm : 5.60...5.80  
 4th speed rpm : 900  
 travel mm : 8.30...8.50  
 5th speed rpm : 1100  
 travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1200  
 Del.quantity : 204.0...206.0  
 1000 : (202.0...208.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 51...59

Testing:  
1st rack travel in: 11.20  
Speed rpm : 890...900  
2nd rack travel in: 4.00  
Speed rpm : 1040...1070  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 600  
Rack travel in m: 12.50...12.70  
3rd speed rpm : 500  
Rack travel in m: 0.00...11.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1200  
Rack travel mm : 12.50...12.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 265  
Rack travel in m: 9.00...9.10  
3rd pressure hPa : 565  
Rack travel in m: 11.20...11.60

START CUT-OUT

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 241.0...247.0  
1000 s: (239.0...249.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 148.0...152.0  
1000 s: (146.0...154.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 890...900

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...220.0  
1000 s: (170.0...230.0)  
Rack travel in mm : 10.00...10.60

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5185-P22

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 c4  
 Edition : 01.02.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 877  
 Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...975PA929-4K  
 Governor no. : 0 421 815 233

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-300A

1st version kW : 224.0  
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 20.1...20.3

100 s: (19.9...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275

travel mm : 0.50...1.00

2nd speed rpm : 325

travel mm : 1.50...1.70

3rd speed rpm : 450

travel mm : 2.90...3.30

4th speed rpm : 1000

travel mm : 8.40...8.60

5th speed rpm : 1200

travel mm : 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975

Aneroid pressure h: 1200

Del.quantity : 201.0...203.0

1000 : (199.0...205.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 600  
Rack travel in m: 11.70...11.90  
3rd speed rpm : 500  
Rack travel in m: 0.00...11.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 975  
Pressure hPa : 1200  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 975

1st pressure hPa : -  
Rack travel in m: 7.70...8.10  
2nd pressure hPa : 235  
Rack travel in m: 9.00...9.10  
3rd pressure hPa : 570  
Rack travel in m: 11.60...12.00

START CUT-OUT

Speed 1/min : 275 (285)

M25

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 221.0...227.0  
1000 s: (219.0...229.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 146.0...150.0  
1000 s: (144.0...152.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1015...1025

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...220.0  
1000 s: (170.0...230.0)  
Rack travel in mm : 10.00...10.60

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5185-P20

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 12,0 i
Edition : 16.02.90
Replaces : 15.12.89
Test oil : ISO-4113
Combination no. : 0 402 746 878
Injection pump
Pump designation : PES6P120A320RS7191
EP type number : 0 412 726 828
Governor
Governor design. : RQV275...1000PA927
Governor no. : 0 421 813 808

Customer-spec. information
Customer : RVI

Engine : MIDR 06-35-40

1st version kW : 314.0
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
x Wall thickness
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90
: (4.75...4.95)
Rack travel in mm : 12.50...13.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 27.7...27.9

100 s: (27.4...28.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 2.3...2.9

100 s: (2.0...3.2)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275
travel mm : 1.10...1.50

2nd speed rpm : 500
travel mm : 3.60...4.20

3rd speed rpm : 700
travel mm : 5.50...5.90

4th speed rpm : 1000
travel mm : 7.60...7.80

5th speed rpm : 1400
travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1060

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 277.0...279.0

1000 : (274.0...282.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 298...306

#### Testing:

1st rack travel in: 12.90  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 242...250

#### Testing:

Speed rpm : 200  
Minimum rack travel: 5.80  
Speed rpm : 275  
Rack travel in mm : 4.50...4.70

#### CONSTANT REGULATION

Speed rpm : 330...430

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.30  
2nd pressure hPa : 600  
Rack travel in m: 12.90...13.00  
3rd pressure hPa : 240  
Rack travel in m: 9.70...10.10

#### START CUT-OUT

Speed 1/min : 225 (245)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1000

Del.quantity cm3/ : 268.0...274.0  
1000 s: (265.0...277.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 128.0...136.0  
1000 s: (125.0...139.0)

Spread cm3 : 10.00  
1000 s: (-)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 142.0...144.0  
1000 s: (139.0...147.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.90

Speed rpm : 1065...1075

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 145.0...175.0  
1000 s: (141.0...179.0)

#### LOW IDLE

Speed rpm : 275

Rack travel in mm : 4.50...4.70

Del.quantity cm3/ : 23.0...29.0  
1000 s: (20.0...32.0)

Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

2. Set fuel delivery in fuel-delivery characteristics with stop above the governor housing.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SAC 10,5 a  
 Edition : 16.02.90  
 Replaces : 2.1.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 879

Injection pump  
 Pump designation : PES6P130A320LS7173-1  
 EP type number : 0 412 736 803  
 Governor  
 Governor design. : RQV400...750PA928  
 Governor no. : 0 421 813 809

Customer-spec. information  
 Customer : SACM

Engine : UD25-L6

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 443 022

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 060

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.00X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 48.0...48.3

100 s: (47.6...48.6)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

2nd speed rpm : 400.0

Rack travel in mm : 4.7...5.3

Del.quantity cm<sup>3</sup>/ : 5.0...5.6

100 s: (4.6...6.0)

Spread cm<sup>3</sup> : 1.0

100 s: (1.4)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 0.50...0.90

2nd speed rpm : 500

travel mm : 1.90...2.10

3rd speed rpm : 650

travel mm : 1.90...2.10

4th speed rpm : 750

travel mm : 5.00...5.80

5th speed rpm : 900

travel mm : 11.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 480.0...483.0

1000 : (476.5...486.5)

Spread cm<sup>3</sup> : 6.00

1000 : (10.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 11.90

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 777...790  
4th rack travel in: 900  
Speed rpm : 0.00...1.00

LOW IDLE 1

Testing:

Speed rpm : 100  
Minimum rack trave: 6.50  
Speed rpm : 400  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 670...730

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

APPLICATION

Navy





BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : BAO 15,9 b3  
 Edition : 06.07.90  
 Replaces : 2.10.89  
 Test oil : ISO-4113

Combination no. : 0 402 746 880

Injection pump  
 Pump designation : PES6P120A32ORS7105  
 EP type number : 0 412 726 800  
 Governor  
 Governor design. : RQV350...900PA935-1  
 Governor no. : 0 421 813 820

Customer-spec. information  
 Customer : BAUDOUIN

Engine : 6P15-2

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 074

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)

Rack travel in mm : 9.00...12.00

N02

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 33.9...34.1

100 s: (33.6...34.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.5...4.9

Del.quantity cm<sup>3</sup>/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.70...1.00

2nd speed rpm : 500

travel mm : 3.10...3.80

3rd speed rpm : 800

travel mm : 6.50...6.90

4th speed rpm : 900

travel mm : 7.80...8.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 940

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 339.0...341.0

1000 : (336.0...344.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 11.00  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 21...29

Testing:  
Speed rpm : 100  
Minimum rack trave: 6.20  
Speed rpm : 350  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 350...450

START CUT-OUT

Speed 1/min : 270 (290)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 940...950

Remarks:

:

APPLICATION

Navy

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER 12,2 f  
 Edition : 06.07.90  
 Replaces : 2.2.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 882  
 Injection pump  
 Pump designation : PES6P120A320RS7156-1  
 EP type number : 0 412 726 830  
 Governor  
 Governor design. : RQV300..1050PA941  
 Governor no. : 0 421 813 834

Customer-spec. information  
 Customer : PERKINS

Engine : 2006 TW-H

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 14.00...14.10  
 Del.quantity cm<sup>3</sup>/ : 26.9...27.1  
 100 s: (26.6...27.4)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 8.3...8.5  
 Del.quantity cm<sup>3</sup>/ : 6.3...6.9  
 100 s: (6.1...7.1)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 0.80...1.20  
 2nd speed rpm : 420  
 travel mm : 3.60...4.20  
 3rd speed rpm : 700  
 travel mm : 4.70...5.30  
 4th speed rpm : 1120  
 travel mm : 5.50...5.70  
 5th speed rpm : 1250  
 travel mm : 8.70...9.10

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 800  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Aneroid pressure h: 1200  
 Del.quantity : 269.0...271.0  
 1000 : (266.0...274.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 98...106

#### Testing:

1st rack travel in: 13.00  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 70...78

#### Testing:

Speed rpm : 200  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 8.30...8.50

#### CONSTANT REGULATION

Speed rpm : 350...420

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.00...14.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 710  
Rack travel in m: 13.10...13.20  
3rd pressure hPa : 560  
Rack travel in m: 11.80...12.00

#### START CUT-OUT

Speed 1/min : 300 (320)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 600

Del.quantity cm3/ : 275.0...281.0  
1000 s: (272.0...284.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 182.0...184.0  
1000 s: (179.0...187.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 185.0...225.0  
1000 s: (181.0...229.0)

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,8 s  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 884  
 Injection pump  
 Pump designation : PES6P120A720LS7196  
 EP type number : 0 412 726 831  
 Governor  
 Governor design. : RQV450..1050PA886-1  
 Governor no. : 0 421 813 835

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 h LA

1st version kW : 304.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 19.00...21.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.20...15.40

Del.quantity cm<sup>3</sup>/ : 28.4...28.6

100 s: (28.1...28.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 450.0

Rack travel in mm : 4.4...5.0

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
 travel mm : 1.40...1.70

2nd speed rpm : 700  
 travel mm : 4.00...4.40

3rd speed rpm : 1100  
 travel mm : 7.60...8.10

4th speed rpm : 1200  
 travel mm : 9.50...10.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 950  
Del. quantity : 284.0...286.0  
1000 : (281.0...289.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 14.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 60...68  
Speed rpm : 450  
Rack travel in mm : 4.40...5.00

#### CONSTANT REGULATION

Speed rpm : 450...650

#### TORQUE CONTROL

Dimension a mm : 0.60  
2nd speed rpm : 1050  
Rack travel in m: 15.40...15.60  
3rd speed rpm : 900  
Rack travel in m: 15.70...15.90  
4th speed rpm : 800  
Rack travel in m: 16.00...16.20

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 950  
Rack travel mm : 15.20...15.40

#### Measurement

Speed 1/min : 600  
1st pressure hPa : 300  
Rack travel in m: 11.80...12.00  
2nd pressure hPa : 600  
Rack travel in m: 13.70...13.90  
3rd pressure hPa : 1200  
Rack travel in m: 15.50...15.70  
4th pressure hPa : -  
Rack travel in m: 10.10...10.50

#### START CUT-OUT

Speed 1/min : 370 (390)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1600  
Speed rpm : 1050  
Del. quantity cm<sup>3</sup>/ : 280.0...283.0  
1000 s: (277.0...286.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del. quantity cm<sup>3</sup>/ : 298.0...302.0  
1000 s: (295.0...305.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 14.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 280.0...300.0  
1000 s: (276.0...304.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 e5  
 Edition : 17.05.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 885  
 Injection pump  
 Pump designation : PES6P12QA72DRS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...875PA944-3K  
 Governor no. : 0 421 815 238

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-275

1st version kW : 205.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.40...11.50

Del.quantity cm<sup>3</sup>/ : 19.2...19.4

100 s: (19.0...19.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 650  
 travel mm : 5.60...5.80

4th speed rpm : 900  
 travel mm : 8.30...8.50

5th speed rpm : 1100  
 travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 192.0...194.0

1000 : (190.0...196.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 10.40  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack trave: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 510  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 600  
Rack travel in m: 12.40...12.80  
4th speed rpm : 450  
Rack travel in m: 0.00...12.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 12.80...13.00

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 355  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 630  
Rack travel in m: 11.50...11.90

START CUT-OUT

NO9

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 268.0...274.0  
1000 s: (266.0...276.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 157.5...161.5  
1000 s: (155.5...163.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 10.40...11.00

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5185-P22



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 e1  
 Edition : 02.05.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 886  
 Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...975PA944-4K  
 Governor no. : 0 421 815 239

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-250A

1st version kW : 186.0  
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975  
 Rack travel in mm : 10.40...10.50  
 Del.quantity cm3/ : 16.4...16.6  
 100 s: (16.2...16.8)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...4.9  
 Del.quantity cm3/ : 4.0...4.6  
 100 s: (3.8...4.8)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
 travel mm : 0.50...1.00  
 2nd speed rpm : 325  
 travel mm : 1.50...1.70  
 3rd speed rpm : 450  
 travel mm : 2.90...3.30  
 4th speed rpm : 1000  
 travel mm : 8.40...8.60  
 5th speed rpm : 1200  
 travel mm : 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 975  
 Aneroid pressure h: 1200  
 Del.quantity : 164.5...166.5  
 1000 : (162.5...168.5)  
 Spread cm3 : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 9.40  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1120...1150  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 600  
Rack travel in m: 10.80...11.00  
3rd speed rpm : 500  
Rack travel in m: 0.00...10.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1200  
Rack travel mm : 10.80...11.00

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 7.50...7.90  
2nd pressure hPa : 195  
Rack travel in m: 8.40...8.50  
3rd pressure hPa : 375  
Rack travel in m: 9.90...10.30

START CUT-OUT

Speed 1/min : 275 (285)

N11

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 198.5...204.5  
1000 s: (196.5...206.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 146.0...150.0  
1000 s: (144.0...152.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 1015...1025

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...220.0  
1000 s: (170.0...230.0)  
Rack travel in mm : 10.00...10.60

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5185-P26

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 e9  
 Edition : 02.05.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 746 888

Injection pump  
 Pump designation : PES6P120A72ORS7164  
 EP type number : 0 412 726 816  
 Governor  
 Governor design. : RQV325...875PA878-15  
 K  
 Governor no. : 0 421 815 235

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EMC6 300L 4VH

1st version kw : 200.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 12.00...13.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

---

Rack travel in mm : 14.90...15.00

---

Del.quantity cm3/ : 22.5...22.7  
 100 s: (22.3...22.9)

---

Spread cm3 : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...4.9  
 Del.quantity cm3/ : 3.9...4.5  
 100 s: (3.7...4.7)

Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.00...3.40

3rd speed rpm : 850  
 travel mm : 5.90...6.10

4th speed rpm : 1000  
 travel mm : 7.40...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del.quantity : 225.0...227.0  
 1000 : (223.0...229.0)

Spread cm3 : 5.00  
 1000 : (9.00)

RATED SPEED

1st version

Control Lever position degrees: 54...62

Testing:

1st rack travel in: 13.90
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1160
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever position degrees: 10...18

Testing:

Speed rpm : 275
Minimum rack trave: 5.90
Speed rpm : 325
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 14.90...15.00
2nd speed rpm : 510
Rack travel in m: 16.80...17.00
3rd speed rpm : 700
Rack travel in m: 15.60...15.80
4th speed rpm : 600
Rack travel in m: 16.40...16.60
5th speed rpm : 420
Rack travel in m: 0.00...16.80

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 16.80...17.00

Measurement

Speed 1/min : 510
1st pressure hPa : -
Rack travel in m: 10.90...11.30
2nd pressure hPa : 375
Rack travel in m: 12.70...12.80
3rd pressure hPa : 735

Rack travel in m: 15.70...16.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 305.0...311.0
1000 s: (302.0...314.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 156.0...160.0
1000 s: (154.0...162.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 13.90
Speed rpm : 915...925

INTERMEDIATE RATED SPEED

Rack travel in mm : 11.20
Speed rpm : 805
Rack travel in mm : 4.80
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (150.0...210.0)
Rack travel in mm : 10.90...11.30

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm3/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5181P16

Delivery-valve spring pre-tension
3.0...3.2 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h  
 Edition : 09.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 890  
 Injection pump  
 Pump designation : PES6P120A720RS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...875PA944-5K  
 Governor no. : 0 421 815 240

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-275

1st version kW : 202.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 13.20...13.30

Del.quantity cm<sup>3</sup>/ : 23.5...23.7

100 s: (23.3...23.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 700

travel mm : 8.00...8.20

4th speed rpm : 900

travel mm : 9.40...9.60

5th speed rpm : 1050

travel mm : 10.60...11.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 235.5...237.5

1000 : (233.5...239.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 12.20  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.90...5.00

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 510  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 550  
Rack travel in m: 13.80...14.00  
4th speed rpm : 450  
Rack travel in m: 13.10...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.80...14.00

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 310  
Rack travel in m: 10.10...10.20  
3rd pressure hPa : 635  
Rack travel in m: 12.50...12.90

START CUT-OUT

N15

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 310.0...314.0  
1000 s: (307.0...317.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 155.5...159.5  
1000 s: (153.5...161.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P4

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D 5  
 Edition : 17.05.90  
 Replaces : 19.03.90  
 Test oil : ISO-4113

Combination no. : 0 403 436 106

Injection pump  
 Pump designation : PES6MW100/12ORS1143  
 EP type number : 0 413 406 137  
 Governor  
 Governor design. : RQV350...1100MW78-2  
 Governor no. : 0 420 083 160

Cust. part no. : 3915907

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA-8.3

1st version kW : 179.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

N16

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15  
 : (3.00...3.20)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

---

Rack travel in mm : 12.70...12.80

---

Del. quantity cm<sup>3</sup>/ : 15.0...15.2  
 100 s: (14.8...15.4)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 7.3...7.5  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1210  
 travel mm : 9.00...9.40  
 2nd speed rpm : 1100  
 travel mm : 7.90...8.10  
 3rd speed rpm : 550  
 travel mm : 3.00...3.60  
 4th speed rpm : 350  
 travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 900  
 Del. quantity : 150.0...152.0  
 1000 : (148.0...154.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 44...52

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1330  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...21  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 7.30...7.50

CONSTANT REGULATION  
Speed rpm : 360...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.60...9.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.80...10.90  
2nd pressure hPa : 520  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 900  
Rack travel in m: 12.70...12.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 76.0...78.0  
1000 s: (74.0...80.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 205.0...225.0  
1000 s: (202.0...228.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.30...7.50  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: C.D.C. # 3915907  
Start-of-delivery mark/lock = 8.0°  
angular displacement of the cam after  
start of delivery of cylinder 1.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D 4  
 Edition : 06.07.90  
 Replaces : 23.04.90  
 Test oil : ISO-4113

Combination no. : 0 403 436 107

Injection pump  
 Pump designation : PES6MW100/120RS1143  
 EP type number : 0 413 406 137  
 Governor  
 Governor design. : RQV350...1100MW82-2  
 Governor no. : 0 420 083 161

Cust. part no. : 3915168

Customer-spec. information  
 Customer : CUMMINS/US

Engine : 6 CTA

1st version kW : 186.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15  
 : (3.00...3.20)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del. quantity cm<sup>3</sup>/ : 15.0...15.2

100 s: (14.8...15.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 7.2...7.4  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.4...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250  
 travel mm : 9.00...9.40  
 2nd speed rpm : 1140  
 travel mm : 7.80...8.00  
 3rd speed rpm : 700  
 travel mm : 3.80...4.40  
 4th speed rpm : 350  
 travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 900  
 Del. quantity : 150.0...152.0  
 1000 : (148.0...154.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 42...50

Testing:

1st rack travel in: 11.70  
Speed rpm : 1150...1160  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 12...20  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.3

Testing:

Speed rpm : 100  
Minimum rack travel: 8.80  
Speed rpm : 350  
Rack travel in mm : 7.20...7.40  
Rack travel in mm : 2.00

CONSTANT REGULATION

Speed rpm : 360...500

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 700  
Rack travel in m: 13.60...13.70  
3rd speed rpm : 900  
Rack travel in m: 12.90...13.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.50...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.80...10.90  
2nd pressure hPa : 570  
Rack travel in m: 12.30...12.60  
3rd pressure hPa : 900  
Rack travel in m: 13.60...13.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del. quantity cm<sup>3</sup>/ : 159.0...161.0  
1000 s: (157.0...163.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 77.0...79.0  
1000 s: (75.0...81.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1150...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 205.0...225.0  
1000 s: (202.0...228.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.20...7.40  
Del. quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (14.0...22.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: C.D.C. # 3915168

Start-of-delivery mark/lock = 8.0°  
angular displacement of the cam after  
start of delivery of cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 A 31  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 444 118  
 Injection pump  
 Pump designation : PES4MW100/72ORS1127  
 EP type number : 0 413 404 103  
 Governor  
 Governor design. : RQV300...1200MW48-13  
 Governor no. : 0 420 083 220

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM364A

1st version kW : 77.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200  
 Rack travel in mm : 11.00...11.10  
 Del. quantity cm<sup>3</sup>/ : 7.5...7.7  
 100 s: (7.3...7.9)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 8.2...8.4  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1325  
 travel mm : 9.40...9.80  
 2nd speed rpm : 1250  
 travel mm : 8.60...8.80  
 3rd speed rpm : 550  
 travel mm : 3.00...3.60  
 4th speed rpm : 300  
 travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1250  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1200  
 Del. quantity : 75.0...77.0  
 1000 : (73.0...79.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version

Control Lever  
position degrees: 107...115

Testing:

1st rack travel in: 10.00  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1310...1340  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 8.3

Testing:

Speed rpm : 100  
Minimum rack trave: 9.70  
Speed rpm : 300  
Rack travel in mm : 8.20...8.40

TORQUE CONTROL

Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 600  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 800  
Rack travel in m: 11.60...11.80  
4th speed rpm : 900  
Rack travel in m: 11.20...11.40

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm3/ : 65.0...68.0  
1000 s: (62.5...70.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Speed rpm : 800  
Del.quantity cm3/ : 70.0...73.0  
1000 s: (67.5...75.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00

Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 8.20...8.40  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 40
Edition : 17.05.90
Replaces : 12.08.88
Test oil : ISO-4113
Combination no. : 0 403 446 207
Injection pump
Pump designation : PES6MW100/72ORS1144
EP type number : 0 413 406 138
Governor
Governor design. : RQ300/1300MW96
Governor no. : 0 420 082 032

Customer-spec. information
Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...8.0

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1425
travel mm : 9.50...9.90

2nd speed rpm : 1350
travel mm : 7.80...8.00

3rd speed rpm : 525
travel mm : 4.90...5.50

4th speed rpm : 300
travel mm : 2.10...2.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 1200

Rack travel in mm : 12.70...14.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Del.quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control Lever  
position degrees: 96...104

Setting point:  
Speed rpm : 1200  
Rack travel in mm : 13.5

Testing:  
1st rack travel in: 10.00  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 71...79  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.9

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 7.80...8.00

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 800  
Rack travel in m: 11.80...12.00  
3rd speed rpm : 585  
Rack travel in m: 12.00...12.20  
4th speed rpm : 1100  
Rack travel in m: 11.00...11.10

#### START CUT-OUT

Speed 1/min : 180 (200)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 76.0...78.0  
1000 s: (74.0...80.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Speed rpm : 585  
Del.quantity cm<sup>3</sup>/ : 68.5...71.5  
1000 s: (66.0...74.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 550

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.80...8.00  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 R25  
 Edition : 17.05.90  
 Replaces : 09.12.88  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 213  
 Injection pump  
 Pump designation : PES6MW100/320RS1112  
 EP type number : 0 413 406 108  
 Governor  
 Governor design. : RQV350...1300MW72-4  
 Governor no. : 0 420 083 170

Customer-spec. information  
 Customer : NAVISTAR

Engine : DT-466

1st version kW : 154.5  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 037

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 016

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0.5

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 900  
 Rack travel in mm : 10.50...10.60  
 Del.quantity cm<sup>3</sup>/ : 9.9...10.1  
 100 s: (9.7...10.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.5...5.6  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1460  
 travel mm : 9.10...9.50  
 2nd speed rpm : 1350  
 travel mm : 8.30...8.50  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Del.quantity : 99.0...101.0  
 1000 : (97.0...103.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 43...51

Testing:

1st rack travel in: 9.50  
Speed rpm : 1365...1385  
2nd rack travel in: 4.00  
Speed rpm : 1470...1480  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 9...17  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

Testing:

Speed rpm : 100  
Minimum rack travel: 7.30  
Speed rpm : 350  
Rack travel in mm : 5.50...5.60

CONSTANT REGULATION

Speed rpm : 390...480

START CUT-OUT

Speed 1/min : 180 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1300  
Del.quantity cm3/ : 101.0...105.0  
1000 s: (99.0...107.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1365...1385

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...180.0  
1000 s: (137.0...183.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.50...5.60

Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Perform pump setting only with IH hose  
with restriction of 1.2 mm diameter.

Before checking sleeve position,  
first adjust latching.

In unlatched condition, do not  
operate greater than  $n = 500$  1/min

Set low idle at stop screw.

Set shutoff stop 1.5...2.0 mm before  
shutoff.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 8,3 S 3  
 Edition : 29.06.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 235  
 Injection pump  
 Pump designation : PES6MW100/32ORS1171  
 EP type number : 0 413 406 156  
 Governor  
 Governor design. : RQV300...1300MW80-5  
 Governor no. : 0 420 083 197

Customer-spec. information  
 Customer : RVI

Engine : MIDS 060212B

1st version kW : 113.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 033  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 101  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0.6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 10.80...10.90  
 Del.quantity cm<sup>3</sup>/ : 8.8...9.0  
 100 s: (8.6...9.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.8...5.4  
 Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s: (1.5...2.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1500  
 travel mm : 8.70...9.10  
 2nd speed rpm : 1350  
 travel mm : 7.60...7.80  
 3rd speed rpm : 500  
 travel mm : 2.80...3.40  
 4th speed rpm : 300  
 travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del.quantity : 88.0...90.0  
 1000 : (86.0...92.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 60...68

Testing:

1st rack travel in: 9.80  
Speed rpm : 1390...1400  
2nd rack travel in: 4.00  
Speed rpm : 1505...1535  
4th rack travel in: 1700  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 300  
Rack travel in mm : 5.80...5.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.80...9.00

Measurement

Speed 1/min : 500

1st pressure hPa : 100  
Rack travel in m: 9.30...9.40  
2nd pressure hPa : 200  
Rack travel in m: 10.20...10.50  
3rd pressure hPa : 700  
Rack travel in m: 10.80...10.90

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 900  
Del.quantity cm3/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1390...1400

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (87.0...113.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.80...5.40  
Del.quantity cm3/ : 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Start-of-delivery mark made with  
prestroke 3.00...3.10 mm at barrel 1